Hydrogeologic Report
for Spray Irrigation Expansion
at the
Inland Bays Regional
Wastewater Facilities
in
Sussex County, Delaware

October 26, 2017

Prepared for: Sussex County, Delaware

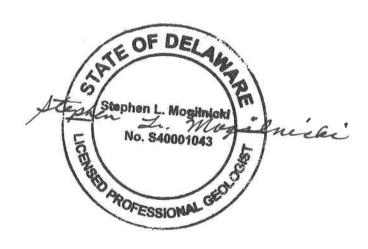
Prepared by:
Whitman, Requardt & Associates, LLP
Baltimore, Maryland

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Prepared for:
Sussex County Engineering Department
2 The Circle
P.O. Box 589
Georgetown, Delaware 19947

Prepared by: Whitman, Requardt & Associates. LLP 801 South Caroline Street Baltimore, Maryland 21231



# Hydrogeologic Report for Spray Irrigation Expansion

#### Inland Bays Regional Wastewater Facilities in Sussex County, Delaware

#### October 26, 2017

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#### 1. Introduction

Whitman, Requardt & Associates, LLP (WRA) prepared this hydrogeologic report for the Sussex County, Delaware Engineering Department. A goal was to identify land sufficient to allow an additional 2 million gallons per day (mgd) of effluent disposal capacity by spray irrigation, at the Inland Bays Regional Wastewater Facilities (IBRWF). WRA assessed the conditions at four spray irrigation expansion sites.

The IBRWF is located approximately 10 miles southwest of Lewes, Delaware. WRA developed a 1 inch = 200 feet scale site plan which shows the topography on a 2-ft. contour interval, the proposed effluent disposal areas, and the soil borings and monitoring wells. Previous reports by WRA about the IBRWF are listed in the References section.

Table 1 summarizes the spray irrigation areas, the application rates (inches per week) and effluent disposal capacities (million gallons per day). The expansion sites are designated A, B, C, and D. The IBRWF began operating in 1992. It currently uses eight spray fields and is permitted for 2.65 mgd. Corn and soybeans are grown on the existing spray fields. The expansion sites are wooded and Sussex County plans to spray effluent on trees.

The capacities in Table 1 are on days when conditions are suitable for spraying. Non-spray periods include when it is raining or freezing, when spraying is disallowed based on water level monitoring data, or when spray fields are out of service due to farming activities or field maintenance. The acreages in Table 1 include reductions for State-required spray irrigation buffers.

WRA completed the following tasks: examination of published geologic data; procurement of a driller subcontractor; observations during drilling; selection of soil samples for lab analysis; measurement of a round of water levels in monitoring wells; coordination of an aquifer test; preparation of a water-table elevation map; and prediction of groundwater mounding from new spray fields.

Table 1: Spray Irrigation Areas

Status	Wetted Field Area	Acres	Rate	Effluent
			(inches	Disposal
			per	Capacity
			week)	(mgd)*
	North Field	103.0	1.86	0.73
	South Field	103.0	1.86	0.73
	North Burton Field	52.0	1.5	0.3
	South Burton Field	41.9	1.0	0.18
Permitted	North Hetti-Lingo Field	47.5	1.0	0.18
	South Hetti-Lingo Field	30.48	2.0	0.24
	East Hetti-Lingo Field	34.46	1.0	0.13
	West Hetti-Lingo Field	20.16	2.0	0.16
	subtotals	432.5		2.65
	Area A (south of Lawson Rd.)	149.8	2.5	1.45
	Area B (north of Lawson Rd.)	13.1	2.5	0.13
Proposed	Area C (north of Inland Bays Rd.)	90.0	2.5	0.87
	Area D (south of Inland Bays Rd.)	190.0	2.5	1.84
	subtotals	442.9		4.29
totals		875.4		6.94

### 2. Regional Geology

WR&A obtained information from publications of the U.S. Geological Survey and the Delaware Geological Survey, which are listed in the References section. The project area is in the Harbeson and Fairmount 7.5-minute quadrangles. Table 2 is a summary of the hydrogeologic units in the vicinity.

Table 2: Hydrogeologic Units

Epoch	Geo	logic Units	Aquifer	Estimated Thickness (feet)
		Dune Deposits		Up to 15
Pleistocene	Columbia Group	Lynch Heights Fm.	Unconfined	3 to 10
		Beaverdam Fm.	Aquifer	110
		Bethany Fm.	Pocomoke Aquifer	100
	Chasanaaka	Manokin Fm.	Manokin Aquifer	150
Miocene	Chesapeake Group	St. Mary's Fm.		80
		Choptank Fm.		200
		Calvert Fm.		300

Fm. = Formation

Sussex County, Delaware is located in the Atlantic Coastal Plain physiographic province, which has an eastward-thickening wedge of sand, silt and clay that rests on bedrock. According to Vroblesky and Fleck (1991) the top of the bedrock in the study area is approximately 6,500 feet below sea level. The oldest Coastal Plain sediments in eastern Sussex County are several thousand feet of sediments ranging in age from Cretaceous to Eocene.

In Miocene time, the area was submerged by a shallow sea. In this period the Chesapeake Group was deposited, which consists of the following from oldest to youngest: the Calvert Formation, the Choptank Formation, the St. Mary's Formation, the Manokin Formation, and the Bethany Formation. The Calvert Formation (consisting mostly of gray sandy silt) and the Choptank Formation (consisting of gray fine to coarse shelly sand) were deposited in predominantly marine environments. The St. Mary's Formation, the Manokin Formation, and the Bethany Formation were deposited by deltas. The St. Mary's Formation consists of bluish-gray fine sandy clay, with some interbeds of very fine to medium sand. The Manokin Formation consists of a lower unit of silty fine sand, which grades into an upper unit of gray fine to coarse sand. The Bethany Formation consists of gray clay or silt interbedded with fine to very coarse sand.

The sediments of the Columbia Group were deposited during the Pleistocene Epoch on top of the eroded surface of the Chesapeake Group. In the study area, the Columbia Group consists of the Beaverdam Formation, the Lynch Heights Formation, and Pleistocene dune deposits forming sandy ridges.

The Beaverdam Formation was deposited in a fluvial to estuarine environment in the late Pliocene Epoch. It is a heterogeneous unit ranging from very coarse sand with pebbles to silty clay. It has a white, silty matrix that distinguishes it from overlying deposits.

The Lynch Heights Formation is a thin heterogeneous deposit ranging from reddish brown, pale yellow, and light gray silty, clayey, very coarse sand, to pale yellow, light gray gravelly sand. Its estimated thickness in the study area is 3 to 10 feet.

Several aquifers exist in the Coastal Plain deposits of eastern Sussex County, Delaware. The uppermost aquifer is the unconfined aquifer, which exists in the Columbia Group sediments. The unconfined aquifer receives recharge from precipitation, transmits water to the deeper aquifers, and maintains stream flow.

The unconfined aquifer exists in the sandy parts of the Columbia Group. Fine-grained units in the Lynch Heights Formation and the Beaverdam Formation can function as semiconfining units, if they have sufficient thickness and areal extent. The regional base of the unconfined aquifer is the base of the Beaverdam Formation.

The Bethany Formation contains sand units that form the confined Pocomoke Aquifer. The Manokin Formation contains the confined Manokin Aquifer, which is a major water supply source in Sussex County. The contact of the Manokin Formation with the underlying St. Mary's Formation is the base of the fresh-water aquifer system. The base of the Manokin Aquifer is 250 to 300 feet below sea level. The Choptank Formation, which is underneath the St. Mary's Formation, probably contains saline water.

#### 3. Investigation

WRA conducted hydrogeologic investigations in the proposed spray areas designated A, B, C, and D in the report by Accent Environmental (2016). The four areas are land owned by Sussex County. The

Area A is located generally south of Lawson Road, and Area B is north of Lawson Road. Area C is generally north of Inland Bays Road, and Area D is south of Inland Bays Road.

WRA selected locations for soil borings and wells. Surveyors from Adams-Kemp Associates, Inc. of Georgetown, Delaware staked the drilling locations. The surveyors also located domestic water wells within 1,000 feet of the expansion areas.

The initial drilling was in 2014 by Geomatrix, Inc. Additional drilling began in September 2016 by John Hynes & Associates. Table 3 is a summary of the soil borings, which were 20 to 40 feet deep. In total, fifty-one soil borings were completed at the expansion sites. Drillers advanced borings using the hollow-stem auger method and the standard penetration test. Logs for the borings are in Appendix 1.

WRA selected soil samples from borings for laboratory analysis of grain size distribution. Table 4 is a summary of the grain size data. The grain size lab reports are in Appendix 2.

Twenty-one monitoring wells were constructed in the unconfined aquifer by the hollow stem auger method. The wells ranged from 14 to 26 feet deep. Table 5 is a summary of the monitoring wells. The wells have ten feet of 2-inch diameter, PVC well screen with 0.020-inch slots, well gravel pack, and a bentonite seal.

In October 2016, WRA measured a round of water levels in the site monitoring wells, and the data is summarized in Table 6. Water levels measured by Sussex County are included in Appendix 4. For the computation of groundwater elevations, surveyors provided PVC well casing elevations for the monitoring wells to the nearest 0.01 foot.

Table 3: Soil Borings (continues on next page)

Site	Boring	Land Surface Elevation (FASL)	Depth Drilled (FBLS)
	MW-1	31.5	40
	MW-2	29.2	40
	MW-3	31.3	40
	MW-12	28.6	20
Α	MW-13	29.4	20
	B-27	31.1	20
	B-28	29.0	20
	B-29	32.4	20
	B-30	28.1	20
	MW-7	32.7	40
	MW-8	34.1	40
В	MW-9	32.0	40
	B-25	34.9	20
	B-26	32.4	20
	MW-14	30.3	20
	MW-15	29.0	20
	MW-16	36.8	26
	MW-17	37.0	26
	MW-18	33.2	22
	B-1	30.6	20
С	B-2	32.5	20
	B-3	33.4	20
	B-4	33.9	20
	B-5	34.0	20
	B-6	34.7	20
	B-7	35.7	20
	B-8	46.0	20
FASL = fee	et above sea le	vel	
FBLS = fee	et below land s	surface	,

Table 3: Soil Borings (continued from previous page)

Site	Boring	Land Surface	Depth Drilled
		Elevation	(FBLS)
		(FASL)	
	MW-19	34.1	24
	MW-20	28.0	20
	MW-21	29.3	20
	MW-22	28.3	20
	MW-23	28.4	20
	MW-24	29.5	20
	MW-25	26.7	20
	MW-26	31.5	26
	B-9	29.9	20
	B-10	29.7	20
	B-11	28.9	20
<b>D</b>	B-12	28.2	20
D	B-13	28.6	20
	B-14	29.2	20
	B-15	27.4	20
	B-16	27.5	20
	B-17	27.4	20
	B-18	28.8	20
	B-19	27.5	20
	B-20	27.9	20
	B-21	27.3	20
	B-22	30.0	20
	B-23	27.4	20
	B-24	31.6	20

Table 4: Grain Size Data (continues on next page)

Site	Boring	Depth Interval (FBLS)	% Gravel*	% Sand**	% Fines***
	MW-1	2 – 6	0.0	78.7	21.3
	MW-1	10 - 14	1.3	80.6	18.1
	MW-1	26 - 30	2.2	84.8	13.0
	MW-2	0 - 4	1.4	78.4	20.2
	MW-2	6 - 10	0.0	85.6	14.4
	MW-2	20 - 24	0.0	83.0	17.0
	MW-3	10 - 14	0.7	79.7	19.6
Α	MW-3	20 - 24	0.7	83.4	15.9
	MW-3	36 - 40	0.0	81.4	18.6
	MW-12	14 - 16	10.3	81.2	8.5
	MW-13	10 – 12	0.2	88.4	11.4
	B-27	12 – 14	0.0	91.5	8.5
	B-28	4 – 6	2.7	88.7	8.6
	B-29	6 – 8	0.4	89.0	10.6
	B-30	18 – 20	4.2	88.1	7.7
<b>D</b>	B-25	14 – 16	0.3	82.0	17.7
В	B-26	18 – 20	1.9	19.5	78.6
	MW-14	16 – 18	0.1	89.9	10.0
	MW-15	16 - 18	1.3	90.6	8.1
	MW-16	10 – 12	0.0	48.9	51.1
	MW-16	24 – 26	0.0	91.8	8.2
	MW-17	16 - 18	0.0	87.4	12.6
	MW-17	24 - 26	0.1	90.8	9.1
	MW-18	12 - 14	0.4	88.7	10.9
	MW-18	16 – 18	0.4	88.9	10.7
	B-1	4 - 6	0.2	55.2	44.6
С	B-2	14 – 16	3.0	84.3	12.7
	B-3	10 – 12	0.2	70.9	28.9
	B-3	16 - 18	1.1	84.5	14.4
	B-4	6 – 8	0.2	49.7	50.1
	B-4	16 - 18	0.1	89.7	10.2
	B-5	12 – 14	0.7	87.3	12.0
	B-6	16 – 18	2.7	89.2	8.1
	B-7	2 – 4	0.2	95.7	4.1
	B-7	16 - 18	1.3	90.4	8.3
	B-8	16 - 18	0.0	87.6	12.4

<sup>\*</sup>Gravel is coarser than the No. 10 sieve.

<sup>\*\*</sup>Sand is finer than the No. 10 sieve and coarser than the No. 200 sieve.

<sup>\*\*\*</sup>Fines are finer than the No. 200 sieve.

FBLS = feet below land surface

Table 4: Grain Size Data (continued from previous page)

Site	Boring	Depth Interval (FBLS)	% Gravel*	% Sand**	% Fines***
	MW-19	14 - 16	0.1	92.0	7.9
	MW-19	22 – 24	0.3	87.2	12.5
	MW-20	14 – 16	24.6	67.2	8.2
	MW-21	16 – 18	0.6	90.3	9.1
	MW-22	8 - 10	0.6	85.0	14.4
	MW-22	12 – 14	1.1	89.8	9.1
	MW-23	12 – 14	1.9	87.9	10.2
	MW-24	16 - 18	11.8	82.5	5.7
	MW-25	8 - 10	0.0	85.6	14.4
	MW-25	12 – 14	0.3	78.1	21.6
	MW-25	16 - 18	1.4	89.1	9.5
	MW-26	6 - 8	0.6	82.3	17.1
	MW-26	24 – 26	4.6	83.5	11.9
	B-9	2 – 4	1.8	72.9	25.3
	B-10	8 – 10	2.8	84.7	12.5
	B-11	14 – 16	0.9	93.2	5.9
D	B-12	8 – 10	0.6	86.2	13.2
	B-13	10 - 12	0.0	81.7	18.3
	B-14	16 – 18	0.1	88.1	11.8
	B-15	8 - 10	3.9	83.1	13.0
	B-15	14 - 16	0.9	87.6	11.5
	B-16	8 - 10	1.3	86.2	12.5
	B-16	12 – 14	0.4	92.6	7.0
	B-17	10 - 12	0.0	83.3	16.7
	B-18	14 - 16	0.3	92.7	7.0
	B-19	10 - 12	2.4	88.1	9.5
	B-19	16 - 18	22.1	72.7	5.2
	B-20	12 – 14	1.1	91.3	7.6
	B-21	12 - 14	0.2	74.0	25.8
	B-22	12 – 14	0.1	17.6	82.3
	B-23	4 – 6	0.1	98.0	1.9
	B-23	12 - 14	0.5	88.7	10.8
	B-24	12 – 14	0.4	34.2	65.4

<sup>\*</sup>Gravel is coarser than the No. 10 sieve.

FBLS = feet below land surface

<sup>\*\*</sup>Sand is finer than the No. 10 sieve and coarser than the No. 200 sieve.

<sup>\*\*\*</sup>Fines are finer than the No. 200 sieve.

Table 5: Monitoring Well Construction Data

Site	Well No.	DNREC Permit No.	Screened Interval (FBLS)	PVC Height* (FALS)	Top of PVC Elevation** (FASL)	Year Drilled
	MW-1	248848	11.5 – 21.5	1.45	34.11	2014
	MW-2	248849	10 - 20	1.64	31.41	2014
Α	MW-3	248850	11.5 – 21.5	1.41	33.60	2014
	MW-12	256134	10 - 20	2.43	31.02	2016
	MW-13	256135	10 - 20	1.85	31.24	2016
	MW-7	248851	10 - 20	1.71	35.34	2014
В	MW-8	248847	10 - 20	1.68	36.36	2014
	MW-9	248852	8 - 14	1.70	34.72	2014
	MW-14	255715	10 - 20	2.74	33.14	2016
	MW-15	255716	10 - 20	2.52	31.50	2016
С	MW-16	255717	16 - 26	2.43	39.23	2016
	MW-17	255718	16 - 26	2.47	39.48	2016
	MW-18	255719	12 - 22	2.49	35.69	2016
	MW-19	255720	16 - 26	2.26	36.37	2016
	MW-20	255721	10 - 20	2.98	30.93	2016
	MW-21	255722	10 - 20	2.34	31.70	2016
D	MW-22	255723	10 - 20	2.47	30.74	2016
U	MW-23	255724	10 - 20	2.09	30.50	2016
	MW-24	255725	10 - 20	2.39	31.93	2016
	MW-25	255726	10 - 20	2.65	29.40	2016
	MW-26	255727	16 - 26	2.56	34.05	2016
	et above land s				ce	

FASL = feet above sea level \*measured by WRA

<sup>\*\*</sup>elevations reported by Adams-Kemp Associates, Inc. on June 22, 2017

WRA coordinated an aquifer test in the unconfined aquifer to estimate the transmissivity of the aquifer, which is its ability to transmit water. Somerset Well Drilling Co., Inc. performed the 72-hour test as a subcontractor to John Hynes & Associates. The aquifer test data is in Appendix 5.

For aquifer testing, Somerset constructed a 6-inch diameter pumping well (DW-2) with 33 feet of screen. They also drilled a 2-inch diameter observation well (DW-1) having similar screen. The two wells were 30 feet apart. Borehole geophysical data obtained during drilling indicated the base of the unconfined aquifer is 100 feet below the land surface.

The aquifer test started on June 19, 2017. The static water level was approximately 8 feet below the land surface. The pumping rate was 101.8 gallons per minute. WRA interprets that the most reliable data from the test is from 7 to 700 elapsed minutes, when the observation well drawdown falls roughly on a straight line in a semilog graph of drawdown vs. time. After the aforementioned straight-line period, heavy rain began about 3,600 minutes into the test. Rain continued for about three hours and likely influenced the later drawdown data.

WRA derived a transmissivity from the test equal to 51,000 square feet per day. The hydraulic conductivity of the aquifer is 550 feet/day, based on dividing the transmissivity by the saturated aquifer thickness of 92 feet.

Table 6: Water Levels in Monitoring Wells in October 2016

	I	I	I		I		l	
		Date	Depth to	PVC	Depth to	Top of PVC	Groundwater	
Site	Well No.	I WEILING I	Measured	Water*	Height*	Water**	Elevation***	Elevation**
			(FBTOPVC)	(FALS)	(FBLS)	(FASL)	(FASL)	
	MW-1	10/14/2016	7.72	1.45	6.27	34.11	26.39	
	MW-2	10/14/2016	8.45	1.64	6.81	31.41	22.96	
Α	MW-3	10/14/2016	10.47	1.41	9.06	33.60	23.13	
	MW-12	10/14/2016	6.43	2.43	4.05	31.02	24.59	
	MW-13	10/14/2016	7.63	1.85	5.78	31.24	23.61	
	MW-7	10/14/2016	5.21	1.71	3.50	35.34	30.13	
В	MW-8	10/14/2016	5.85	1.68	4.17	36.36	30.51	
	MW-9	10/14/2016	5.40	1.70	3.70	34.72	29.32	
	MW-14	10/06/2016	8.89	2.74	6.15	33.14	24.25	
	MW-15	10/06/2016	6.90	2.52	4.38	31.50	24.60	
С	MW-16	10/06/2016	16.13	2.43	13.70	39.23	23.10	
	MW-17	10/06/2016	16.83	2.47	14.26	39.48	22.65	
	MW-18	10/06/2016	11.93	2.49	9.44	35.69	23.76	
	MW-19	10/06/2016	12.10	2.26	9.84	36.37	24.27	
	MW-20	10/06/2016	7.21	2.98	4.23	30.93	23.72	
	MW-21	10/06/2016	9.08	2.34	6.74	31.70	22.62	
D	MW-22	10/06/2016	7.98	2.47	5.51	30.74	22.76	
U	MW-23	10/06/2016	8.35	2.09	6.26	30.50	22.15	
	MW-24	10/06/2016	10.29	2.39	7.90	31.93	21.64	
	MW-25	10/06/2016	8.70	2.65	6.05	29.40	20.70	
	MW-26	10/06/2016	13.48	2.56	10.92	34.05	20.57	
FALS :	feet above	e land surface.	FBLS = feet be	elow land sur	face. FBTOP	VC = feet below	top of PVC	
*measured by WRA. **computed by WRA. ***Elevations from Adams-Kemp Associates 6/22/2017								

#### 4. Site Hydrogeology

The land surface at the expansion sites varies from 27 to 46 feet above sea level. Based on the borings and lab grain size tests, the uppermost 40 feet of the Columbia Group sediments consist predominantly of brown, orange-brown, or gray quartz sand, with lesser amounts of silt and gravel. Site borings intermittently encountered scattered, discontinuous lenses of fine-grained sediments that are not laterally extensive.

WRA prepared a water table elevation map on the site plan at a scale of 1 inch = 200 feet based on the data in Table 6. The groundwater flow direction is to the southeast. The hydraulic gradient across Areas A and B is 0.0027. The hydraulic gradient across Areas C and D is 0.00083.

Effluent disposal sites are necessarily assessed in the "wet season" of January to April, when water levels in the unconfined aquifer tend to be the shallowest. Appendix 4 contains hydrographs of the available wet season data. Sussex County staff measured wet season water levels in monitoring wells at Areas A and B during 2015 to 2017. At Area A, the shallowest water table was approximately 6 feet below the land surface. At Area B, the shallowest water table was approximately 4 feet below the land surface. The range between the shallowest and deepest water levels was approximately 6 to 8 feet In individual wells at Areas A and B.

Site-wide wet season data is not yet available for Areas C and D, and the next opportunity to make observations is in 2018. In October 2016, groundwater was 6 feet below the land surface or deeper in the six wells at Area C, except in MW-15 in the southwest corner, where water was approximately 4 feet below the land surface. At Area D in October 2016, water was 5 feet below the land surface or deeper in the eight wells, except in MW-20 on the northwest side where it was approximately 4 feet.

#### 5. Groundwater Mounding

Groundwater mounding is the rise above the initial water level surface in an aquifer, as a result of infiltration. WRA assessed mounding using the approach in U. S. Geological Survey Scientific Investigations Report 2010-5102, which is based on the Hantush method.

The Hantush calculation provides conservative (high) mound heights, because of the following hydraulic assumptions:

- Surface water runoff is assumed to be zero, i.e. all the sprayed effluent is assumed to reach the water table.
- Evapotranspiration of effluent from soil or plants is also assumed to be zero.
- The water table is assumed to be initially flat, although it actually has a hydraulic gradient that will allow groundwater mounds to decay.
- The analysis assumes that effluent loading is continuous for the whole period, although
  actually it will be intermittent, which will allow mounds to decay.
- The analysis assumes there are no constant head boundaries such as streams, which function as drains.

The groundwater mounding analysis requires input values for the following:

- rate of effluent applications
- area of application
- initial saturated thickness of the unconfined aquifer
- porosity of the aquifer material
- hydraulic conductivity of the aquifer
- duration of application

DNREC has typically permitted spray application rates up to 2.5 inches per week at suitable sites. In the mounding analysis, WRA assessed the impact of 2.5 inches per week, which is equivalent to 0.03 feet/day.

The calculation requires an estimate of the half length and half width of the application area. Half the side of an equivalent square area is 1,277 feet for Area A; 377.5 feet for Area B; 990 feet for Area C; and 1,438.5 feet for Area D.

The initial saturated thickness of the aquifer was assumed to be 96 feet in the groundwater mounding analysis. This is equivalent to the 100-ft. thick layer of sand observed above the confining layer at well DW-2, minus a water level of 4 feet deep. The assumed aquifer porosity is 0.25, which is a typical value for sand. The hydraulic conductivity used in the calculations was 550 feet/day, which was determined by the aquifer test.

Table 7 contains estimates of the theoretical groundwater mound height above the initial water table at the expansion areas. The prediction is for time periods varying from 1 day to 1 year. The predicted mound heights are less than 2 feet, after a year of continuous spraying at each area. Conservatively assuming a 4-ft. deep water table, the theoretical 1-year mounds would remain underneath the required 2-ft. thick unsaturated zone buffer. The buffer is between the land surface and the top of the mound.

Table 7: Groundwater Mound Heights

Spray Area	1 day	7 days	30 days	365 days	
А	0.1	0.5	0.9	1.6	
В	0.05	0.1	0.14	0.2	
С	0.1	0.4	0.6	1.0	
D	0.1	0.5	1.0	1.9	
data in feet					

#### 6. Conclusion

In 2016 – 2017, WRA conducted a hydrogeologic investigation at four wooded spray irrigation expansion sites at the Inland Bays Regional Wastewater Facilities in Sussex County, Delaware. A goal was to identify land to develop an additional 2 million gallons per day (mgd) of effluent disposal capacity. Among the four areas assessed, Areas C and D are closer to the wastewater plant, and Areas A and B are further west of the plant.

WRA performed a groundwater mounding analysis using site-derived hydrogeologic parameters and conservative assumptions. The analysis indicated that 2.71 mgd of disposal at Areas C and D combined, based on spraying 2.5 inches per week, is feasible from a hydraulic standpoint. The analysis also indicated that 1.58 mgd at 2.5 inches per week is feasible at Areas A and B combined.

The State typically requires weekly monitoring of water levels in monitoring wells during the January to April wet season, as part of the permitting process for new spray irrigation fields. Sussex County obtained wet season data at Area A and Area B. Wet season data remains to be collected at Area C and Area D.

The State also requires that the ambient groundwater quality be established at the new spray irrigation areas. Ambient conditions are assessed by performing three rounds of groundwater sample collection and laboratory analysis, with the sampling events occurring thirty days apart. The State guidelines have a specific list of chemical parameters for the groundwater sampling.

WRA recommends that Sussex County perform the aforementioned wet season monitoring and groundwater quality sampling, to facilitate permitting of the new sites.

#### 7. References

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# Appendix 1 Boring and Well Logs

WATER SUPPLY SECTION **DIVISION OF WATER RESOURCES** 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

http://www.dnrec.state.de.us/

#### WELL COMPLETION REPORT

FAX: 302-739-7764	
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	#4000 7898
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD
Permit #: 288,48 Local ID: MW-/ Tax Map/Parcel #: 234-2100-151000 Property Owner: SUSSEX CONTY COUNCIL- Water Well Contractor GEOMATRIX DAILANC Lic #: 806 Well Driller In Charge During Construction: PHUL J.SUIT	□ Bored □ Mud Rotary □ Driver □ Jetted □ Air Rotary □ Cable Tool □ Washed □ Reverse Rotary □ Other (Specify):  Total Depth Of Excavation (Feet BGS): 2/-5  Construction Date: / \
CASING INSTALLATION: INNER OUTER	CONTRACTOR
	Screen Diameter (Inches): Screen Material:
WELL USE:	. /
□ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation □ Other (Specify) ■ MONTORY 6	Pump Manufacturer: Horsepower: Horsepower: Rated Capacity: (GPM) Pump Intake Setting(ft. BGS): Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump Pump Installed By: □ Others Date:
Gravel Pack: From: 9,5 Feet To: 21.5 Feet	Site Plan - If different from original application, must note changes such as
Gravel Pack: From:	distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).
Static Water Level: 14 Feet Below Above Ground Surface	
Pumping Water Level:Feet On (Date):GPM  After:Hours Pumping Rate:GPM  Pumping Method /Device: □ Airlift □ Mechanical (Pump) Other:  Was A Geophysical Log Taken? □ Yes □ No If "Yes", By:	36
WELL HEAD COMPLETION.	Te 100
WELL HEAD COMPLETION:  Type: Pitless Adapter Standard "T"  Well Pit Pad Mount  Other - Specify: 57. CK W STELL COVER  Well Head Completed: A Inches Above Below Ground Surface	
Was The Well Tag Attached In Accordance With Current Regulations?  YES □ NO If "NO", Please Explain:	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller in Charge of Well Construction
	### 683 13-16-14  Well Driller License # Date

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30

http://www.dnrec.state.de.us/

AND ENVIRONMENTAL CONTROL

DAYS OF CONSTRUCTION. A INCLUDED WITH THIS REPORT.

#### WELL COMPLETION REPORT

PHONE: 302-739-9944

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

WELL FORMATION LOG MUST BE

FAX: 302-739-7764	40007898
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	# / DRILLING / EXCAVATION METHOD
PERASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY  Permit #: 2 48849 Local ID: MU-2  Tax Map/Parcel #: 234-21/00 - 15/00  Property Owner: 5 USSEX COUNTY COUNCIL  Water Well Contractor GEOMATRIX DRIZENEW Lic #: 806  Well Driller In Charge During Construction: PAUL J: 5007	□ Auger □ Bored □ Mud Rotary □ Driver □ Jetted □ Air Rotary □ Cable Tool □ Washed □ Reverse Rotary □ Other (Specify): □ Total Depth Of Excavation (Feet BGS): □ Construction Date: □ 2 -11 -1 4
CASING INSTALLATION: INNER OUTER  (1) (2) (2)  Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  AGS=Above Ground Surface BGS=Below	Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material:
WELL USE:  □ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation □ Other (Specify)	Pump Manufacturer: Horsepower: Horsepower: Horsepower: Use Type: GPM) Pump Intake Setting(ft. BGS): Pump Type: Submersible Jet Vertical Turbine Pump Pump Installed By: Others Date:
Gravel Pack: From:	Site Plan - If different from original application, must note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).  I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller in Charge of Well Construction
	## 603 12-16-19   Well Driller License # Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

FAX: 302-739-7764

#### STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION, A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	#40007898					
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD					
Permit #: 248850 Local ID: MW-3  Tax Map/Parcel #: 234-21'00 - 151'00  Property Owner & USSEX COUNTY COUNTY  Water Well Contractor GEOMATRIX DRING WC Lic #: 806  Well Driller In Charge During Construction: 9AUL J. SULT	Auger					
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:					
Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  AGS=Above Ground Surface BGS=Belo	Screen Top (Feet BGS): Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material: W Ground Surface Screen Slot Size (1000 of an Inch):					
WELL USE:	n 4m					
□ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation □ Other (Specify) □ Other (Specify)	Pump Manufacturer: Horsepower: Horsepower: Rated Capacity: (GPM) Pump Intake Setting(ft. BGS): Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump Pump Installed By: □ Others Date:					
Gravel Pack: From: 9.5 Feet To: 21.5 Feet	Site Plan - If different from original application, must note changes such as					
Grout Type: Bentonite Clay Cement Bentonite Clay Plug Other: From: From: Feet To: 9 5 Feet Type Of Non-Grout Backfill Of Well Annulus:	distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).					
From:Feet To: Feet	THE SAME					
Static Water Level: Feet	5.					
Was A Geophysical Log Taken? ☐ Yes Pool If "Yes", By:						
WELL HEAD COMPLETION:  Type: Pitless Adapter Standard "T"  Well Pit Pad Mount  Other - Specify STICK W STEEL COVEL						
Well Head Completed: 2 Inches ■ Above □ Below Ground Surface  Was The Well Tag Attached In Accordance With Current Regulations?	I HODBOY A PRIOM TOWN					
YES NO If "NO", Please Explain:	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller in Charge of Well Construction  ### 12-16-14					
	Well Driller License # Date					

STATE OF DELAWARE **DEPARTMENT OF NATURE RESOURCES** 

AND ENVIRONMENTAL CONTROL

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#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	# 46607898				
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD				
Permit #: 248851 Local ID: MW-7  Tax Map/Parcel #: 234-21.00 - 151.00  Property Owner 5255X COUNTY COUNCEL  Water Well Contractor GEOMATRIX DEIWNG WC Lic #: 806  Well Driller In Charge During Construction: PAUL J. SULT	□ Auger □ Bored □ Mud Rotary □ Driver □ Jetted □ Air Rotary □ Cable Tool □ Washed □ Reverse Rotary □ Other (Specify): □  Total Depth Of Excavation (Feet BGS): 2  Construction Date: 12-8-14				
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:				
	Screen Top (Feet BGS):  Screen Bottom (Feet BGS):  Screen Diameter (Inches):  Screen Material:				
WELL USE:					
□ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation □ Other (Specify) □ Manual/Lawn Irrigation □ Other (Specify)	Pump Manufacturer: Horsepower: Horsepower: Rated Capacity: (GPM) Pump Intake Setting(ft. BGS): Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump Pump Installed By: □ Others Date:				
Gravel Pack: From: Feet To: 20 Feet	Site Plan - If different from original application, must note changes such as				
Grout Type: Bentonite Clay Cement Bentonite Clay Plug  Other: From: Feet To: Feet  Type Of Non-Grout Backfill Of Well Annulus:	distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).				
From:Feet To:Feet	1-18 <sub>14.0</sub>				
Static Water Level: 12 Feet Below Above Ground Surface					
Pumping Water Level:Feet On (Date):					
Pumping Water Level:Feet On (Date):	őe:				
Pumping Water Level:Feet On (Date):	- One				
Pumping Water Level:Feet On (Date):  After:Hours Pumping Rate:GPM  Pumping Method /Device: □ Airlift □ Mechanical (Pump) Other:  Was A Geophysical Log Taken? □ Yes □ No If "Yes", By:  WELL HEAD COMPLETION:  Type: □ Pitless Adapter □ Standard "T"	žv.				
Pumping Water Level:Feet On (Date):					
Pumping Water Level:Feet On (Date):					
Pumping Water Level:Feet On (Date):	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.				
Pumping Water Level:Feet On (Date):	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.				
Pumping Water Level:Feet On (Date):	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS				

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

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WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

FAX: 302-739-7764	# 4000705				
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD				
Permit #: 248847 Local ID: MW-8  Tax Map/Parcel #: 234-21:05-151:03  Property Owner: 5 USSEX COUNTY COUNCE U  Water Well Contractors FONATRIX DRIVING WC Lic #: 806  Well Driller In Charge During Construction: PAUL 5.5017	Auger □Bored □Mud Rotary □Driver □Jetted □Air Rotary □Cable Tool □Washed □Reverse Rotary □Other (Specify):  Total Depth Of Excavation (Feet BGS):  Construction Date: 12-16-14				
Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  AGS=Above Ground Surface BGS=Below	SCREEN INSTALLATION:  Screen Top (Feet BGS): Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material: Screen Slot Size (1000 of an Inch):				
WELL USE:  □ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation □ Other (Specify)	Pump Manufacturer: Horsepower: Horsepower: Pump Type: Submersible Jet Vertical Turbine Pump Pump Installed By: Others Date:				
Gravel Pack: From:	Site Plan - If different from original application, must note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).  I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller in Charge of Well Construction				
	Signature - Well Driller in Charge of Well Construction  PAUL J. Suit # 603 12-16-19  Well Driller License # Date				

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

FAX: 302-739-7764

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## WELL COMPLETION REPORT

INCLUDED WITH THIS REPORT.

# 40007898				
WELL CONSTRUCTION METHOD				
Augered o Bored o Cable Tool o Driven o Jetted o Air Rotary o Mud Rotary o Reverse o Washed o Other (Specify):  Total Depth of Excavation:				
SCREEN INSTALLATION				
SCREEN TOP:  SCREEN BOTTOM:  SCREEN DIAMETER:  SCREEN MATERIAL:				
SCREEN SLOT SIZE O. 20 /THOUSANDS				
GRAVEL PACK SIZE				
Cir Diag Valida late in a delivery in the control of the circumstance of the circumsta				
Site Plan - Include lot size and dimensions, distances from well to house, property lines, nearest road, and all nearby septic systems (include suitable plot plan if available). (If different from original application)				
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driffer in Charge of Well Construction  PAUL J SUIT #603 12-16-14				

WELL CONSTRUCTION LOG									
Client	Whitman, Requardt & Associat	es. L	LP.				Well	# <u>MW-1</u>	
Project Na	me <u>Sussex County RIB.</u> Milsboro Delaware.						Job	# <u>W.O.# 1425</u>	6
						LICA		- II D' OH T-	
Datum Surf. Elev	FT         Inspector           ed         12/11/2014           Date Completed	121		117	Urilling Meth Casing Diam	iod <u>HSA</u> leter <u>2" In.</u>	We	ell Ulameter <u>2                                    </u>	n. <u>.</u>
Date Starte	ed <u>12/11/2014</u> Date Completed _	12/11/2	2014		Mud Type _	N/A	Ro	ock Core Dia. <u>NA</u>	
					AS BU	ILT WELL DIA	AGRAM		
**	SOIL DESCRIPTION	ELEV	100 480 100	프塭		- T		COMMENTS	5
15 ji	Color, Moisture, Density, Size, Lithology		JOS SOLI	88					X
- 0.5	6" ORGANIC PEAT.		17		<b>↑</b>		<b>一</b> 木		
_	Brown to gray, moist to wet, very loose to loose to very loose, fine		11/2		DNA		Cement Grout		
-	to medium, <b>SAND, WITH TRACE</b> OF CLAY.		11/1	5_	7. 40		Juama		
			1//	_	h Scl				
			1./	10-	2-inch Sch. 40 PVC		*		
			111	10_		<b>888</b>	ᡮ		
			36	-	*		Seal		-
14.0	Cray wat loose modium to		134	15	< 0.20" Slotted 2" Screen ≯		r Sand — Bentonite		_
	Gray, wet, loose, medium to coarse, <b>SAND</b> .			-	25		Filter Sand Bentoni		
18.0			<u> </u>		Sotte		III		_
_	Yellowish tan, wet, loose to very loose to medium dense, fine to		13	20	503				
-	medium, <b>SAND, WITH TRACE OF</b> CLAY.		11/1	] =	<b>X</b>		*		
-			11/	-			). 		
			1/1	25					
			1.5	=			l		E
			1//	]			) Japse		
30.0	Yellowish tan, wet, loose, medium			30			Formation collapse		
32.0	to coarse, SAND, WITH TRACE						rmatic		
-	Yellowish tan, wet, loose to			35			Fo		
	medium dense, fine to medium,  SAND, WITH TRACE OF GRAVEL.	77							=
38.0	Vollaudek top viot lance fine to		7	• =					
40.0	- mediani, control, marring Lariette		11	40			<u>*</u>		
	Bottom of test boring 40.0 feet.			ΙÍ					
	Bottom of test boning 40.0 feet.								
				45					7
_				=					
-				50	]				
	WELL DETAILS			100	DRI	LLING METH	IOD	Geomatrix	AP
	DEPTH 21.5 FT SAND/GRAV	EL FILT	TER PAC	K:				Drilling 1	
TOP OF F SCREEN RISER LE	LENGTH 10.0 FT BENTONITE				DC - D	HOLLOW STEM AU DRIVING CASING MUD ROTARY	סחשטו	Baltimpre	MD.
TYPE OF	WELL COVER Stick up. WELL PERMI				AR - A	AIR ROTARY/AIR	HAMMER	guilluighigh	
						ET ROTARY			

#### WELL CONSTRUCTION LOG Whitman, Requardt & Associates, LLP. \_\_\_\_\_ Well # <u>MW-2</u> \_\_\_\_\_ Job # <u>W.O.</u># 14256 Project Name Sussex County RIB. Location <u>Milsboro Delaware.</u> Driller <u>Paul Suit</u> Drilling Method HSA \_\_\_\_\_ Well Diameter <u>2" In.</u> Surf. Elev. FT Casing Diameter 2" In. Hole Diameter 8" In. Inspector \_\_\_ Date Completed 12/11/2014 Date Started 12/11/2014 Mud Type N/A Rock Core Dia. NA AS BUILT WELL DIAGRAM STRATA DEPTH SOIL DESCRIPTION ELEV COMMENTS Color, Moisture, Density, Size, Lithology 6" ORGANIC PEAT \*Cement Grout 2.0 Brown, dry, loose, medium, SAND. 40 PVC Brown, moist, loose, medium, SAND, WITH A LITTLE CLAY. 2-inch Sch. Brown to gray, moist, loose, medium, SAND. < 0.20" Slotted 2" Screen > 10.0 Gray, wet, loose to very loose to medium dense, fine to coarse, Filter Sand SAND Formation collapse 35 40.0 Bottom of test boring 40.0 feet. WELL DETAILS DRILLING METHOD Geomatrix Drilling Inc. SAND/GRAVEL FILTER PACK: FROM <u>8.0</u> TO <u>20.0</u> FT WELL TIP DEPTH . TOP OF RISER \_\_\_\_\_ SCREEN LENGTH . 0.0 FT 10.0 FT HSA - HOLLOW STEM AUGERS BENTONITE SEAL: FROM 6.0 TO 8.0 FT DC - DRIVING CASING altimore MD RISER LENGTH \_\_\_\_\_\_ TYPE OF WELL COVER . LOCK NUMBER \_\_IOL320 10.0 FT MR - MUD ROTARY Stick up. AR - AIR ROTARY/AIR HAMMER WELL PERMIT NO DE-248849 CT - CABLE TOOL WR -WET ROTARY

#### WELL CONSTRUCTION LOG Whitman, Requardt & Associates, LLP. Well # MW-3 Project Name <u>Sussex County</u> RIB. W.O.# 14256 \_\_\_\_ Job # \_\_ Location <u>Milsboro</u> Delaware. Driller <u>Paul Suit</u> Drilling Method HSA \_\_\_\_\_ Well Diameter <u>2" In.</u> Datum \_\_\_ Surf. Elev. \_ FT Casing Diameter 2" In. Hole Diameter 8" In. Inspector \_\_\_ Date Completed 12/11/2014 Mud Type N/A Date Started <u>12/11/2014</u> Rock Core Dia. NA AS BUILT WELL DIAGRAM DEPTH SOIL DESCRIPTION ELEV COMMENTS Color, Moisture, Density, Size, Lithology 6" ORGANIC PEAT 2.0 Cement Grout Brown, moist, loose, fine to 40 PVC medium, SAND. Brown, moist, loose, fine to medium, SAND, WITH A LITTLE 6.0 TO A TRACE OF CLAY. 8.0 Yellow, damp, loose, fine to medium, SAND, WITH TRACE OF GRAVEL. Orangish brown, moist to wet, loose to medium dense, fine to medium, SAND. 16.0 Grayish white, wet, loose, medium, SAND 22.0 Gray, wet, medium dense, medium. 24.0 SAND, WITH TRACE OF CLAY & Gray, wet, medium dense to loose to medium dense, medium to Formation collapse coarse, SAND. 36.0 Gray, wet, loose, fine to medium, SAND, WITH TRACE OF CLAY. 40.0 Bottom of test boring 40.0 feet. WELL DETAILS DRILLING METHOD Geomatrix Drilling Inc SAND/GRAVEL FILTER PACK: FROM 9.5 TO 21.5 FT 21.5 FT WELL TIP DEPTH = 410-242-9220 TOP OF RISER \_ 0.0 FT HSA - HOLLOW STEM AUGERS 10.0 FT DC - DRIVING CASING SCREEN LENGTH = BENTONITE SEAL: eltimore MD RISER LENGTH 11.5 FT TYPE OF WELL COVER Stick up. LOCK NUMBER 10L320 11.5 FT FROM 7.5 TO 9.5 FT MR - MUD ROTARY AR - AIR ROTARY/AIR HAMMER WELL PERMIT NO DE-248850 CT - CABLE TOOL WR -WET ROTARY

#### WELL CONSTRUCTION LOG Whitman. Requardt & Associates, LLP. \_\_ Well # <u>\_\_MW-7</u> Client Project Name Sussex County RIB. W.O.# 14256 \_\_\_\_ Job # \_\_ Location \_\_\_\_\_Milsboro Delaware. Driller Paul Suit Drilling Method HSA Well Diameter 2" In. Datum \_ Surf. Elev. \_\_FT Casing Diameter 2" In. Hole Diameter 8" In. Inspector \_ Date Started 12/08/2014 Date Completed 12/08/2014 Mud Type N/A Rock Core Dia. NA AS BUILT WELL DIAGRAM STRATA SOIL DESCRIPTION ELEV COMMENTS Color, Moisture, Density, Size, Lithology 900 6" ORGANIC PEAT. \*Cement Grout\* Brown, dry, loose, medium, SAND. 40 PVC 4.0 Grayish tan, moist, loose, medium, 2-inch Sch. SAND, WITH TRACE OF CLAY. ★ 0.20" Slotted 2" Screen ★ 10.0 Gray, moist to wet, loose, fine to medium, SAND. Filter Formation collapse 30 32.0 Gray, wet, medium dense to loose to medium dense, fine to coarse, 35 SAND 40 40.0 Bottom of test boring 40.0 feet. 50 WELL DETAILS DRILLING METHOD Geometrix Drilling Inc SAND/GRAVEL FILTER PACK: FROM 8.0 TO 20.0 FT WELL TIP DEPTH \_ 0.0 FT TOP OF RISER \_ HSA - HOLLOW STEM AUGERS 10.0 FT SCREEN LENGTH BENTONITE SEAL: FROM 6.0 TO 8.0 FT DC - DRIVING CASING #144more RISER LENGTH \_ 10.0 FT MR - MUD ROTARY TYPE OF WELL COVER \_ LOCK NUMBER \_\_10L320 AR - AIR ROTARY/AIR HAMMER WELL PERMIT NO \_DE-248851 CT - CABLE TOOL WR -WET ROTARY

#### WELL CONSTRUCTION LOG Whitman. Requardt & Associates. LLP. \_\_\_\_\_ Well # \_MW-8 Project Name Sussex County RIB. \_\_\_\_\_ Job # \_\_\_\_ W.O.# 14256 Location \_\_\_\_ Milsboro Delaware. Driller Paul Suit Drilling Method HSA Well Diameter 2" In. Datum \_\_\_ Surf. Elev. FT Casing Diameter 2" In. Inspector \_\_\_ Hole Diameter 8" In. Date Completed 12/10/2014 Date Started \_12/10/2014 Mud Type N/A Rock Core Dia. NA AS BUILT WELL DIAGRAM STRATA SOIL DESCRIPTION COMMENTS Color, Moisture, Density, Size, Lithology \* Cement Grout 6" ORGANIC PEAT. Brown, moist, loose, medium, 2-inch Sch. 40 PVC SAND, WITH TRACE OF CLAY 4.0 Tan, dry, medium dense, medium, SAND 8.0 Grayish tan to gray, moist to < 0.20" Slotted 2" Screen wet, medium dense to loose, medium, SAND, WITH TRACE OF Filter 28.0 Gray, wet, very loose to loose, 30 fine to medium, SAND. 34.0 35 Gray, wet, medium dense, medium to coarse, SAND 40 40.0 Bottom of test boring 40.0 feet. 45 50 WELL DETAILS Geometrix DRILLING METHOD Drilling Inc SAND/GRAVEL FILTER PACK: FROM 8.0 TO 20.0 FT WELL TIP DEPTH . TOP OF RISER \_ 0.0 FT HSA - HOLLOW STEM AUGERS 10.0 FT SCREEN LENGTH DC - DRIVING CASING BENTONITE SEAL: eltimore FROM 6.0 TO 8.0 FT RISER LENGTH \_ 10.0 FT MR - MUD ROTARY TYPE OF WELL COVER . LOCK NUMBER 10L320 AR - AIR ROTARY/AIR HAMMER WELL PERMIT NO \_DE-248847 CT - CABLE TOOL WR -WET ROTARY

#### WELL CONSTRUCTION LOG Whitman, Requardt & Associates, LLP. Well # MW-9 Project Name Sussex County RIB. \_\_\_\_\_ Job # \_\_\_\_ W.O.# 14256 Location <u>Milsboro Delaware</u>. Driller <u>Paul Suit</u> Drilling Method HSA Well Diameter 2" In. Surf. Elev. \_\_FT Casing Diameter 2" In. Hole Diameter 8" In. Inspector \_\_\_\_\_ Date Completed <u>12/10/2014</u> Date Started 12/10/2014 Mud Type N/A Rock Core Dia. NA AS BUILT WELL DIAGRAM SOIL DESCRIPTION COMMENTS ELEV Color, Moisture, Density, Size, Lithology 6" ORGANIC PEAT. 2-inch Sch. 40 PVC Tan, dry to damp, very loose to Screen loose, medium, SAND. Slotted 2". 8.0 Filter Sand Grayish white, moist to wet, medium dense, medium, SAND, WITH TRACE OF CLAY. 14.0 Orangish brown to gray, wet, stiff to soft, CLAY. Seal 1) Clay layer sealed from 14.0 to 22.0 feet with Betonite betonite pellets. 22.0 Orangish brown, wet, loose, 24.0 medium, SAND, WITH CLAY Grayish tan, wet, very loose to loose, fine to medium, SAND. Formation collapse 30 35 36.0 Grayish tan, wet, very loose to medium dense, fine to coarse, SAND, WITH TRACE OF GRAVEL 40.0 Bottom of test boring 40.0 feet. 45 WELL DETAILS DRILLING METHOD Geomatrix Drilling Inc. SAND/GRAVEL FILTER PACK: FROM <u>6.0</u> TO <u>14.0</u> FT WELL TIP DEPTH \_ 0.0 FT HSA - HOLLOW STEM AUGERS TOP OF RISER \_ DC - DRIVING CASING MR - MUD ROTARY 6.0 FT SCREEN LENGTH BENTONITE SEAL: FROM 4.0 TO 6.0 FT 8.0 FT RISER LENGTH \_ TYPE OF WELL COVER Stick up. AR - AIR ROTARY/AIR HAMMER WELL PERMIT NO \_DE-248852 CT - CABLE TOOL LOCK NUMBER \_ 10L320 WR -WET ROTARY

#### SOIL BORING LOG Whitman, Requardt & Associates, LLP. \_\_\_\_\_\_ Boring # \_MW-1 Project Name Sussex County RIB. \_\_\_\_\_ Job # <u>W.O.#</u> 14256 Location \_\_\_\_\_Milsboro Delaware. Hammer Type Safety,140 LBS. Boring Method HSA Driller Paul Suit Datum \_\_\_ Sampler Type SPT Borehole Diameter 8" In. Surf. Elev. \_ Ft. Inspector \_\_\_ Rig Type \_\_\_\_\_Mobil B-47 Date Started 12/11/2014 Date Completed 12/11/2014 Rock Core Size NA SAMPLE STRATA BORING & SAMPLING SOIL DESCRIPTION ELEV PID NOTES Color, Moisture, Density, Size, Lithology Blows/6\* Rec. No. Type (ppm) 6" ORGANIC PEAT. SPT 1-1-1-1 20" Brown to gray, moist to wet, very 12" SPT 1-1-1-1 2 loose to loose to very loose, fine to medium, SAND, WITH TRACE 3 SPT 2-1-2-1 20" OF CLAY. SPT 3-3-3-3 20" SPT 3-1-3-3 22" SPT 18" 1-1-1-1 1) Encountered water at 14.0 feet. 20" SPT 1-2-2-4 14.0 15 Gray, wet, loose, medium to SPT 8-5-4-5 22" coarse, SAND. 9 SPT 3-2-5-6 24" 18.0 2) 2" monitoring well Yellowish tan, wet, loose to very 24" 10 SPT 2-5-3-3 installed to 21.5 loose to medium dense, fine to feet. medium, SAND, WITH TRACE OF 24" 11 SPT 2-1-1-2 CLAY. 12 SPT 1-1-2-3 24" 24" 13 SPT 1-2-2-4 14 SPT 3-5-6-7 24" SPT 24" 15 4-6-7-7 30.0 Yellowish tan, wet, loose, medium 16 SPT 1-4-5-7 24" 32.0 to coarse, SAND, WITH TRACE OF GRAVEL. 17 24" SPT 6-3-3-6 Yellowish tan, wet, loose to 35 M 18 SPT 4-5-7-9 24" medium dense, fine to medium, SAND, WITH TRACE OF GRAVEL. SPT 24" 19 4-5-6-6 38.0 Yellowish tan, wet, loose, fine to 20 SPT 5-4-6-8 24" 40.0 medium, **SAND, WITH A LITTLE** CLAY. Bottom of test boring 40.0 feet. 45 BORING METHOD SAMPLER TYPE GROUNDWATER DEPTH Geomatrix Drilling Inc. HSA - HOLLOW STEM AUGERS AT COMPLETION \_N/A\_\_ FT. SPT - STANDARD PENETRATION AFTER \_\_\_\_\_ HRS. \_\_\_ AFTER 24 HRS. N/A FT. CAVED AT N/A FT. HA/TR-HAND AUGER & TRIPOD TEST SPLIT SPOON DC - DRIVING CASING ST - SHELBY TUBE

SPT-Standard Penetration Test: Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

eltimere.

AS - AUGER SAMPLE RC - ROCK CORE

MD - MUD DRILLING

AR - AIR ROTARY/AIR HAMMER

#### SOIL BORING LOG Whitman, Requardt & Associates, LLP. Boring # MW-2 Client \_\_\_ Project Name Sussex County RIB. \_\_\_\_\_ Job # \_\_\_\_ W.O.# 14256 Milsboro Delaware. Location \_\_\_\_ Driller Paul Suit Hammer Type Safety,140 LBS. Boring Method \_ HSA Datum\_ Surf. Elev. \_\_Ft. Sampler Type SPT Borehole Diameter \_ 8" In. Inspector\_ Date Completed 12/11/2014 Mobil B-47 Rock Core Size NA Date Started 12/11/2014 Rig Type \_\_\_ STRATA DEPTH SAMPLE SYMBOL SOIL DESCRIPTION BORING & SAMPLING SAME ELEV PID Color, Moisture, Density, Size, Lithology NOTES Blows/6" No. Type Rec. (ppm) 6" ORGANIC PEAT: SPT 2-2-2-3 20" 2.0 Brown, dry, loose, medium, SAND. SPT 2 4-3-4-3 12" Brown, moist, loose, medium, 4.0 SAND, WITH A LITTLE CLAY. 3 SPT 2-2-2-2 20" Brown to gray, moist, loose, 20" medium, SAND. 4 SPT 3-3-2-4 5 SPT 5-4-2-3 20" 10 10.0 Gray, wet, loose to very loose to SPT 18" 6 2-3-2-2 1) Encountered water at medium dense, fine to coarse, 12.0 feet. SAND. 7 SPT 16" 1-1-2-2 15 8 SPT 1-1-3-5 24" 9 SPT 5-7-9-10 24" 2) 2" monitoring well SPT 24" 10 12-9-12-13 installed to 20.0 201 feet. 11 SPT 3-5-6-6 24" 24" 12 SPT 6-3-4-6 13 SPT 3-3-3-4 24" 24" 14 SPT 5-6-7-9 24" 15 SPT 3-4-4-4 16 SPT 24" 6-7-9-10 17 24" SPT 10-6-10-11 35 V 18 SPT 12-10-9-10 24" SPT 24" 19 10-9-10-11 20 SPT 6-8-10-11 24" 40 40.0 Bottom of test boring 40.0 feet. 45 BORING METHOD SAMPLER TYPE GROUNDWATER DEPTH Geomatrix Drilling Inc HSA - HOLLOW STEM AUGERS SPT - STANDARD PENETRATION AT COMPLETION N/A AFTER \_\_\_\_\_\_ HRS. \_\_\_\_ AFTER 24 HRS. \_N/A \_\_ FT. CAVED AT \_\_N/A \_\_\_ FT. HA/TR-HAND AUGER & TRIPOD TEST SPLIT SPOON 110-242-9220

SPT-Standard Penetration Test: Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

ST - SHELBY TUBE AS - AUGER SAMPLE RC - ROCK CORE

DC - DRIVING CASING

AR - AIR ROTARY/AIR HAMMER

MD - MUD DRILLING

#### SOIL BORING LOG Whitman, Requardt & Associates, LLP. Boring # MW-3 Project Name Sussex County RIB. Job # \_\_\_\_\_\_ Job # \_\_\_\_\_ W.O.# 14256 Location \_\_\_\_\_Milsboro Delaware. \_\_ Driller <u>Paul Suit</u> Hammer Type Safety, 140 LBS. Boring Method HSA Datum \_\_\_ Surf. Elev. Ft. Sampler Type <u>SPT</u> Borehole Diameter <u>8" In.</u> Inspector \_\_\_\_\_ Date Started \_12/11/2014 \_\_\_\_ Date Completed 12/11/2014 Rig Type \_\_\_\_\_Mobil B-47 Rock Core Size NA SAMPLE STRATA SANPLE SOIL DESCRIPTION BORING & SAMPLING ELEV PID NOTES Color, Moisture, Density, Size, Lithology Blows/6" Rec. Nn Type (ppm) 900 6" ORGANIC PEAT 20" SPT 2-2-2-3 2.0 Brown, moist, loose, fine to 2 SPT 16" 3-4-4-4 medium, SAND. Brown, moist, loose, fine to 3 SPT 3-2-2-3 24" medium, **SAND**, **WITH** A **LITTLE** 6.0 TO A TRACE OF CLAY. 4 SPT 5-3-3-4 20" 8.0 Yellow, damp, loose, fine to 18" 5 SPT medium, SAND, WITH TRACE OF 4-3-4-4 10 GRAVEL. 6 SPT 3-3-4-4 20" 1) Encountered water at Orangish brown, moist to wet. 13.0 feet. loose to medium dense, fine to 7 SPT 3-4-4-4 20" medium, SAND. 15 M 8 SPT 3-5-7-7 20" 16.0 Grayish white, wet, loose, medium, 9 SPT 4-4-4-5 24" SAND 2) 2" monitoring well 10 SPT 3-5-5-5 24" installed to 21.5 feet. 11 SPT 2-2-2-3 24" 22.0 Gray, wet, medium dense, medium, 12 SPT 2-6-8-12 24" 24.0 SAND, WITH TRACE OF CLAY & 25 24" 13 GRAVEL . SPT 4-4-7-9 Gray, wet, medium dense to loose 14 SPT 6-4-4-5 24" to medium dense, medium to coarse, SAND. 15 SPT 6-5-5-6 24" 30 16 SPT 6-2-3-6 24" 17 SPT 2-2-5-8 24" 35 SPT 18 5-5-8-9 24" 36.0 Gray, wet, loose, fine to medium, 19 SPT 4-5-5-4 24" SAND, WITH TRACE OF CLAY. 24" SPT 20 3-4-6-7 40.0 Bottom of test boring 40.0 feet. 45 BORING METHOD SAMPLER TYPE GROUNDWATER DEPTH Geomatrix Drilling Inc HSA - HOLLOW STEM AUGERS AT COMPLETION N/A FT. SPT - STANDARD PENETRATION AFTER \_\_\_\_\_\_HRS.\_\_\_\_FT. AFTER 24 HRS.\_N/A\_\_FT. CAVED AT \_N/A\_\_FT. HA/TR-HAND AUGER & TRIPOD TEST SPLIT SPOON DC - DRIVING CASING ST - SHELBY TUBE AS - AUGER SAMPLE RC - ROCK CORE MD - MUD DRILLING

SPT-Standard Penetration Test: Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

AR - AIR ROTARY/AIR HAMMER

#### SOIL BORING LOG \_\_ Boring # <u>MW-7</u> Whitman, Requardt & Associates, LLP. \_\_\_ Job # \_\_\_ W.O.# 14256 Project Name Sussex County RIB. Location \_\_\_\_\_Milsboro Delaware. Hammer Type <u>Safety,140 LBS.</u> Driller <u>Paul Suit</u> Boring Method HSA Surf. Elev, \_\_Ft.\_ Sampler Type SPT Borehole Diameter 8" In. Inspector \_\_\_\_\_ Rig Type \_\_\_\_\_ Mobil B-47 Date Completed <u>12/08/2014</u> Date Started <u>12/08/2014</u> Rock Core Size NA

	SOIL DESCRIPTI	ON .		100	烘프			SAMPLE			BORING & SAMPLING	
STRAILA	Color, Moisture, Density, Si	ze, Lithology	ELEV	SYMBOL	SAMPLE	No.	Type	Blows/6"	Rec.	PID (ppm)	NOTES	300000
99.50	6" ORGANIC PEAT.			27,21		1	SPT	1/12''-1-1	3''			
-	Brown, dry, loose, mediu	m, <b>SAND</b> .			1	2	SPT	2-2-2-2	18"			
4.0	Grayish tan, moist, loose	e, medium.		7,7	5	3	SPT	2-2-3-3	24"			
	SAND, WITH TRACE OF	CLAY.			-	4	SPT	4-5-5-7	18"			
					1	5	SPT	5-5-3-3	24"			
10.0	Gray, moist to wet, loos	e fine to		0.0	107	6	SPT	3-3-3-3	24"			
=	medium, <b>SAND</b> .	e, lille to			1	7					1) Encountered water at 12.0 feet.	Ε
-					15		SPT	2-2-2-2	24"			E
					-	8	SPT	1-1-2-4	24"		2) 2" monitoring well installed to 20.0	
					-	9	SPT	1-2-2-3	24"		feet.	
					<u>20</u>	10	SPT	2-2-3-3	24"			
					1	11	SPT	1-1-2-3	24"			
						12	SPT	2-4-4 <b>-</b> 5	20"			
					25	13	SPT	2-4-6-8	24"			
					-	14	SPT	3-4-3-4	24"			=
=					30	15	SPT	1-3-3-5	24"			
32.0						16	SPT	3-3-3-4	24"			
_	Gray, wet, medium dense				-	17	SPT	3-5-7-7	24"			
_	to medium dense, fine to	o coarse,			35	18	SPT	3-4-4-6	20"			
					=	19	SPT	3-5-8-8	24"			
					400	20	SPT	7-8-8-10	24"			
40.0	Bottom of test boring 4	10.0 feet.			40							
_					-							
					45							
												F
					-							
					50							
B0	DRING METHOD	SAMPLE	R TYP	Ε			GRO	UNDWATER DE	EPTH		Geometrix -	

HSA - HOLLOW STEM AUGERS HA/TR-HAND AUGER & TRIPOD

DC - DRIVING CASING MD - MUD DRILLING

AR - AIR ROTARY/AIR HAMMER

SPT - STANDARD PENETRATION

TEST SPLIT SPOON ST - SHELBY TUBE

AS - AUGER SAMPLE RC - ROCK CORE

AT COMPLETION N/A FT. AFTER HRS. FT.
AFTER 24 HRS. N/A FT.
CAVED AT N/A FT.

SPT-Standard Penetration Test: Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

#### SOIL BORING LOG Whitman, Requardt & Associates, LLP. \_\_\_\_\_\_ Boring # <u>MW-8</u> Client \_\_\_ Project Name Sussex County RIB. \_\_\_\_ Job # <u>W.O</u>.# 14256 Location <u>Milsboro Delawa</u>re. Driller Paul Suit Hammer Type <u>Safety,140 LBS.</u> Boring Method \_ HSA Datum\_\_ Sampler Type <u>SPT</u> Surf. Elev. \_ Ft. Borehole Diameter \_ 8" In. Inspector \_\_ Date Completed 12/10/2014 Date Started \_12/10/2014 Mobil B-47 Rig Type \_\_\_ Rock Core Size NA STRATA SAMPLE SAMPLE SYMBOL SOIL DESCRIPTION BORING & SAMPLING PID Color, Moisture, Density, Size, Lithology NOTES Blows/6" No. Type Rec. (ppm) 99.50 6" ORGANIC PEAT. SPT 1-2-3-1 14" Brown, moist, loose, medium, SPT 2 2-1-2-3 18" SAND, WITH TRACE OF CLAY. 4.0 Tan, dry, medium dense, medium, 3 3-5-5-5 SPT 20" SAND SPT 4 6-5-6-7 20" 8.0 Grayish tan to gray, moist to SPT 6-6-5-6 20" wet, medium dense to loose, SPT medium, SAND, WITH TRACE OF 6 4-6-6-7 20" 1) Encountered water at CLAY. 12.0 feet. 7 SPT 3-6-7-7 18" 15 23" 8 SPT 2-2-3-4 2) 2" monitoring well installed to 20.0 9 SPT 3-5-5-8 24" feet. 24" 10 SPT 3-3-6-6 11 SPT 3-3-3-3 24" 24" 12 SPT 4-2-2-3 13 SPT 4-4-5-6 24" 14 SPT 3-3-3-4 24" 28.0 Gray, wet, very loose to loose, 24" 15 SPT 1-1-2-6 30 fine to medium, SAND. SPT 16 1-1-2-2 24" 24" 17 SPT 3-2-4-4 34.0 35 V Gray, wet, medium dense, medium 18 SPT 4-7-8-8 18" to coarse, SAND 24" 19 SPT 10-13-14-17

BORING METHOD

Bottom of test boring 40.0 feet.

HSA - HOLLOW STEM AUGERS HA/TR-HAND AUGER & TRIPOD

DC - DRIVING CASING

40.0

MD - MUD DRILLING AR - AIR ROTARY/AIR HAMMER SAMPLER TYPE

SPT - STANDARD PENETRATION TEST SPLIT SPOON

ST - SHELBY TUBE

AS - AUGER SAMPLE RC - ROCK CORE

GROUNDWATER DEPTH

7-10-13-15

24"

AT COMPLETION N/A AFTER \_\_\_\_\_ HRS. \_\_\_ AFTER 24 HRS. N/A FT. CAVED AT N/A FT.

Geomatrix Drilling Inc 410-242-9220

SPT-Standard Penetration Test: Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

20

40

45

SPT

#### SOIL BORING LOG Whitman, Requardt & Associates, LLP. Boring # MW-9 Client \_\_\_ Project Name Sussex County RIB. \_\_\_\_\_ Job # \_\_\_\_\_W.O.#\_14256 Location <u>Milsboro Delaw</u>are. Driller Paul Suit Hammer Type Safety,140 LBS. Boring Method HSA Borehole Diameter <u>8" In.</u> Surf. Elev. \_ Ft. Sampler Type SPT Inspector \_\_\_ Rig Type Mobil B-47 Date Started 12/10/2014 Date Completed <u>12/10/2014</u> Rock Core Size NA SAMPLE STRATA SAMPLE SOIL DESCRIPTION BORING & SAMPLING ELEV PID Color, Moisture, Density, Size, Lithology NOTES No. Blows/6" Rec. Type (ppm) 6" ORGANIC PEAT. 16" SPT 1-1-1-1 I) Encountered water at Tan, dry to damp, very loose to 12.0 feet. 2 SPT 2-2-3-2 12" loose, medium, SAND 5 18" 3 SPT 2-2-3-3 SPT 4-4-5-6 16" 8.0 Grayish white, moist to wet, SPT 18" 5 7-7-6-7 10 medium dense, medium, SAND, 2) 2" monitoring well WITH TRACE OF CLAY. SPT 4-7-7-8 16" installed to 14.0 feet. 16'' SPT 6-8-5-7 14.0 15 Orangish brown to gray, wet, stiff 18" SPT 3-2-2-2 to soft, CLAY. 9 SPT 2-2-3-2 24" 3) Clay layer sealed 10 2-1-2-2 20" SPT from 14.0 to 22.0 feet, 20 with betonite pellets SPT 11 2-3-2-2 24" after formation 22.0 collapse, then well was Orangish brown, wet, loose, 12 SPT 2-2-3-2 24" 24.0 medium, SAND, WITH CLAY installed. 24" 13 SPT 1-1-1-1 Grayish tan, wet, very loose to 20" 14 SPT 1-2-2-3 loose, fine to medium, SAND. 6'' 15 SPT 1-2-2-3 30 24" 16 SPT 2-2-3-4 17 SPT 5-2-2-2 24"

BORING METHOD

Grayish tan, wet, very loose to

medium dense, fine to coarse,

SAND, WITH TRACE OF GRAVEL

Bottom of test boring 40.0 feet.

HSA - HOLLOW STEM AUGERS HA/TR-HAND AUGER & TRIPOD

DC - DRIVING CASING

36.0

40.0

MD - MUD DRILLING AR - AIR ROTARY/AIR HAMMER SAMPLER TYPE

SPT - STANDARD PENETRATION TEST SPLIT SPOON

ST - SHELBY TUBE

AS - AUGER SAMPLE RC - ROCK CORE GROUNDWATER DEPTH

6-3-3-4

2-1-1-4

5-8-7-8

24"

24"

24"

AT COMPLETION N/A FT.
AFTER HRS. FT.
AFTER 24 HRS. N/A FT.
CAVED AT N/A FT.

Geomatrix Drilling Inc 410-242-9220

#10-242-9220 Beltimore MD.

SPT-Standard Penetration Test; Driving 2 Inch OD Sampler 1.0 foot with 140 pound Hammer Falling 30 inches; Blow Count Recorded at 6 inch Intervals PID - PhotoIonization Detector (parts per million)

35 M 18

45

19

20

SPT

SPT

SPT



## LOG OF BORING B-1

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: October 5, 2016

Logged By:

: C. Johnston : M. Hynes

Drilled By: Drilling Method:

Inlan	Inland Bays Regional Wastewater Facilities Drilling Method: Project No : IDH-10/16/279 Total Depth:				: HSA (Geoprobe 7822 DT) : 20 feet						
	Project No.: JDH-10/16/279	Total Depth:	: 20	Teet		T	T				
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks				
0-	Dark grayish brown, wet, very loose, fine SAND, with trace silt (10 YR 4/2, Sand)	e to medium		SP	1	1-1-1	Scale 1" ~ 6.2 feet				
2- - 4-	Brown, wet, loose, fine to medium SANI (10 YR 5/3, Sand)	D, with trace silt		SP	2	6-4-3-2	Approximately 2 inches of organic bearing soil was encountered at the ground surface.				
6-	Brown, wet, very loose to loose, fine to and SILT, trace clay (10 YR 5/3, Loam)			ML/SM	3	10-3-2-2	Groundwater was encountered at 9 feet during drilling operations.				
8-					4	10-3-3-3	At completion water was at 7.5 feet;				
- 10-	Light gray, wet to saturated, loose, fine SAND, with some silt, trace clay (10 YR loam)			SM	5	4-4-4	boring caved in at 10.5 feet.  Laboratory Test Results				
- 12-	Very pale brown, saturated, loose, fine to SAND, with trace silt (10 YR 7/3, Sand)	to medium		SP	6	3-4-4-5	Sample No. 3 From 4 to 6 feet				
14-	Yellow, saturated, loose, fine to medium little silt (10 YR 7/6, Loamy sand)	n SAND, with		SP-SM	7	3-3-4-5	Sieve Analysis				
-	Gray, saturated, loose, fine to medium silt (10 YR 6/1, Sand)	SAND, with trace		SP	8	3-3-3-3	Sieve Passing				
16- -	Light yellowish brown, saturated, loose, SAND, with trace silt (10 YR 6/4, Sand)	fine to medium		SP	9	3-3-3-4	Size % No. 4 100				
18-	Pale brown, saturated, loose, fine to coatrace silt (10 YR 6/3, Sand)	arse SAND, with		SP	10	3-3-4-4	No. 10 99.8 No. 20 98.9 No. 40 93.3				
20	Boring terminated at 20 feet.						No. 60 81.0 No. 100 66.1				
22-							No. 200 44.6				
24-							Natural Moisture = 16.9%				
26-											
28-											
30-											
32-											
34-											
36-											
38-											
40-											
42-											



## **LOG OF BORING B-2**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 5, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inlan	d Bays Regional Wastewater Facilities Drilling Method:		l. Hynes SA (Geop	robe 782	2 DT)	
man	Project No.: JDH-10/16/279 Total Depth:		0 feet	1000 702	.2.01)	•
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Pale brown, wet, very loose, fine to medium SAND, with	ůššů	.		T	
2-	trace silt (10 YR 6/3, Sand)		SP	1	1-1-1-1	Scale 1" ~ 6.2 feet
- 4-	Dark yellowish brown, wet, very loose, fine to medium SAND, with little silt, trace clay (10 YR 4/6, Loamy sand)		SP-SM	2	2-2-2-2	Approximately 3 inches of organic bearing soil was encountered at the ground surface.
_				3	4-2-3-3	Groundwater was encountered at 11
6- - 8-	Brown, wet, medium dense to loose, fine to medium SAND, with some silt, trace clay (10 YR 5/3, Sandy loam)			4	3-5-6-7	feet during drilling operations.  At completion water was at 10 feet;
- 10-	loamy		SM	5	2-5-4-4	boring caved in at 11.5 feet.  Laboratory Test Results
10 - 12-				6	3-3-3-3	Sample No. 8
	Light gray, saturated, very loose to loose, fine to medium SAND, with trace to little silt, trace clay (10 YR			7	2-2-3-3	From 14 to 16 feet Sieve Analysis
-	7/2, Sand)			8	2-2-2-2	Sieve Passing
16-			SP	9	3-4-4-5	Size %
18-					0-4-4-5	1/2" 100 3/8" 99.2
20-				10	4-4-5-5	No. 4 97.9 No. 10 97.0
20	Boring terminated at 20 feet.					No. 20 94.8 No. 40 55.5
22-						No. 60 30.0 No. 100 17.9
24-						No. 200 12.7
26-	,					Natural Moisture = 10.9%
28-						
30 <i>-</i> -						
32-						
34-						
36-						
38-						
40-						
42-				······································	MAN AND THE STREET OF THE STRE	



## LOG OF BORING B-3

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 27, 2016

Logged By: Drilled By: Drilling Method: : C. Johnston : M. Hynes

<u></u>	Baitimore, Maryland 21231	Drilled By:		. Hynes			
Inlan	d Bays Regional Wastewater Facilities	Drilling Method:		SA (Geop	robe 782	2 DT)	
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		Ţ	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-		~ A . I	10020	1	п		<del></del>
2-	Pale brown, wet, loose, fine to medium strace silt (10 YR 6/3, Sand)			SP	1	1-2-2-3	Scale 1" ~ 6.2 feet
-	Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/3, Sand)	lium SAND,		SP	2	3-2-2-3	No organic bearing soil was encountered at the ground surface.
6-	Very pale brown, wet, medium dense, fir SAND, with trace silt (10 YR 7/3, Sand)	ne to medium		SP	3	6-4-5-6	Groundwater was encountered at 13 feet during drilling operations.
-				J. J.	4	4-6-6-7	At completion water was at 13 feet; boring caved in at 15 feet.
8-	Light gray, wet, stiff, clayey SILT, with tra medium sand (10 YR 7/2, Silt loam)	ace fine to		ML	5	3-4-7-7	Laboratory Test Results
10-	Light gray, wet, loose, fine to medium Socialy (10 YR 7/2, Silty clay loam)	AND, with some		sc	6	3-3-4-5	Sample No. 6, From 10 to 12 feet
12-	Light gray, wet to saturated, loose, fine t SAND, with little to some silt (10 YR 7/2,	o medium Sandy loam)		SM	7	3-3-4-4	Sieve Analysis Sieve Passing
14-	Very pale brown, saturated, soft, silty Cl fine to medium sand (10 YR 7/3, Silty cla	AY, with trace ay loam)		CL	8	1-1-2-3	Size %
16-	Yellow, saturated, medium dense, fine to with trace to little silt (10 YR 7/6, Loamy			SP-SM	9	5-8-9-9	3/6" 100 No. 4 99.9 No. 10 99.8
18-	Light gray, saturated, medium dense, fir SAND, with trace to little silt (10 YR 5/2,	e to coarse Loamy sand)		SP-SM	10	3-4-6-7	No. 20 99.5 No. 40 97.6 No. 60 85.2
20-	Boring terminated at 20 feet.		13.11.11		<b></b>		No. 100 64.7 No. 200 28.9
22-							Natural Moisture = 18.3%  Sample No. 8, From 14 to 16 feet
24-							Atterberg Limits
26-							Liquid Limit = 39 Plasticity Index = 19
28-							Natural Moisture = 28.1%
30-							Sample No. 9, From 16 to 18 feet
32-							Sieve Analysis
34-							Sieve Passing Size %
-							3/8" 100 No. 4 99.9
36-							No. 10 98.9 No. 20 92.1 No. 40 73.4
38-							No. 60 47.0 No. 100 26.9
40-							No. 200 14.4 Natural Moisture = 9.5%
42-							



## LOG OF BORING B-4

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 27, 2016 : C. Johnston

Logged By: Drilled By:

: M. Hynes

Inlan	Inland Bays Regional Wastewater Facilities Drilling Method:				: M. Hynes : HSA (Geoprobe 7822 DT)						
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet							
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks				
0-	Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)	ium SAND, with		SP	1	1-1-1-2	Scale 1" ~ 6.2 feet				
2-	Yellowish brown, wet, loose, fine to med with little to some silt (10 YR 5/6, Sandy			SM	2	2-2-2-4	No organic bearing soil was encountered at the ground surface.				
4- - 6-	Light yellowish brown, wet, loose, fine to SAND, with little to some silt, trace clay Sandy loam)			SM	3	6-5-5-5	Groundwater was encountered at 15 feet during drilling operations.				
- 8-	Reddish yellow, wet, medium stiff, silty C trace fine to medium sand (7.5 YR 6/6, 8			CL	4	3-3-5-5	At completion water was at 15 feet; boring caved in at 15.5 feet.				
- 10	Yellow, wet, medium stiff, clayey SILT, v to medium sand (10 YR 7/6, Silt loam)			ML-CL	5	2-3-6-7	Laboratory Test Results				
- 12-	Light gray, wet, medium stiff, silty CLAY to medium sand, mottled (10 YR 7/2, Sil	ty clay loam)		CL	6	2-4-5-5	Sample No. 4, From 6 to 8 feet Sieve Analysis				
- 14 <i>-</i> -	Yellow, wet, medium dense, fine to med little to some silt (10 YR 7/6, Sandy loan	າ)		SM	7	5-6-8-7	Sieve Passing				
16-	Brownish yellow, wet to saturated, mediu to medium SAND, with some silt (10 YR Joam)	um dense, fine 6/6, Sandy		SM	8	5-8-8-8	Size % No. 4 100				
- 18	Light gray, saturated, medium dense, fir SAND, with trace to little silt (10 YR 7/2,			SP-SM	9	4-5-6-7	No. 10 99.8 No. 20 97.8 No. 40 93.0				
- 20-	David and the state of the stat				10	3-3-5-6	No. 60 87.0 No. 100 69.9 No. 200 50.1				
22-	Boring terminated at 20 feet.					77 T T T T T T T T T T T T T T T T T T	Natural Moisture = 15.8%				
- 24							Sample No. 6, From 10 to 12 feet				
- 26-							Atterberg Limits				
- 28-							Liquid Limit = 40 Plasticity Index = 18 Natural Moisture = 23.0%				
- 30							Sample No. 9, From 16 to 18 feet				
32-							Sieve Analysis				
34-							Sieve Passing Size %				
36-							No. 4 100 No. 10 99.9				
38-							No. 20 99.5 No. 40 84.9 No. 60 28.5				
-							No. 100 15.0 No. 200 10.2				
40-							Natural Moisture = 22.1%				
42											



## LOG OF BORING B-5

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 27, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Drilling Method:

	Project No.: JDH-10/16/279	Total Depth:	: 2	0 feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)	ium SAND, with		SP	1	1-1-1-1	Scale 1" ~ 6.2 feet
2-	Pale brown, wet, loose, fine to medium Strace silt (10 YR 6/3, Sand)	SAND, with		SP	2	7-3-3-4	No organic bearing soil was encountered at the ground surface.
4- 6-	Yellowish brown, wet, loose, fine to med with little silt, trace clay (10 YR 5/6, Sand	ium SAND, dy loam)		SM	3	3-5-5-5	Groundwater was encountered at 13 feet during drilling operations.
8	Yellow, wet, stiff, clayey SILT, with trace medium sand (10 YR 7/6, Silt loam)			ML	4	3-5-5-6	At completion water was at 14 feet; boring caved in at 14.5 feet.
- 10-	Yellow, wet, loose, fine to medium SANI (10 YR 7/6 ,Sandy loam)			SM	5	3-3-4-4	Laboratory Test Results
- 12-	Very pale brown, wet, loose, fine to med with some silt (10 YR 7/4, Sandy loam)			SM	6	3-4-4-4	Sample No. 7 From 12 to 14 feet
14-	Very pale brown, wet to saturated, fine to SAND, with trace to little silt (10 YR 7/3,	o coarse Loamy sand)		SP-SM	7	3-4-3-3	Sieve Analysis
- 16					8	3-4-5-5	Sieve Passing Size %
- 18-	Very pale brown, saturated, loose, fine to SAND, with little silt (10 YR 7/3, Sandy lo	oam)		SM	9	2-2-3-4	No. 4 100 No. 10 99.3
20-	Very pale brown, saturated, medium der medium SAND, with little silt (10 YR 7/3,	nse, fine to Sandy loam)		SM	10	2-4-6-7	No. 20 97.2 No. 40 70.2 No. 60 65.7
22 —	Boring terminated at 20 feet.						No. 100 27.8 No. 200 12.0
-							Natural Moisture = 20.7%
24-							
26 – -							
28 <del>-</del>			L	l1			
30-							
32-							
34-							
36-							
38-							
40-							
42-							



## LOG OF BORING B-6

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 28, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inland	Drilled By:  d Bays Regional Wastewater Facilities   Drilling Metl		1. Hynes ISA (Geop	robo 700	יים מיים	
Imani	Project No.: JDH-10/16/279 Total Depth		o feet	nobe roz	.2 01)	
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Very pale brown, wet, very loose, fine to medium	888	.1			
2-	SAND, with trace silt (10 YR 7/4, Sand)		SP	1	1-1-1-2	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered
4-				2	4-2-2-2	at the ground surface.
- 6	Brownish yellow, wet, loose, fine to medium SAND, with some silt, trace clay (10 YR 6/6, Sandy loam)		SM	3	2-3-4-5	Groundwater was encountered at 17 feet during drilling operations.
8-	Yellow, wet, stiff, clayey SILT, with trace fine to medium sand (10 YR 8/6, Silty clay)	_//	CL	4	6-6-7-7	At completion water was at 15.5 feet; boring caved in at 16.5 feet.
- 10-	Yellow, wet, medium stiff, clayey SILT, with trace fine to medium sand (10 YR 8/6, Silty clay)	e	CL	5	4-5-5-5	Laboratory Test Results
10-	Light gray, wet, very stiff, clayey SILT, with trace fine to medium sand (10 YR 7/2, Silty clay)		CL	6	4-8-8-9	Sample No. 4 From 6 to 8 feet
14-	Brownish yellow, wet, medium dense, fine to medium SAND, with some silt (10 YR 6/6, Sandy loam)	n	SM	7	4-6-7-7	Atterberg Limits
16-	Reddish yellow, wet, medium dense, fine to medium SAND, with some silt (7.5 YR 6/6, Sandy loam)		SM	8	8-10-12-14	Liquid Limit = 36 Plasticity Index = 16 Natural Moisture = 11.7%
-	Very pale brown, wet to saturated, medium dense, fi to medium SAND, with trace to little silt (10 YR 7/3, Loamy sand)	ne	SP-SM	9	4-6-6-7	Sample No. 9
20-	Light yellowish brown, saturated, loose, fine to coars SAND, with trace silt (10 YR 6/4, Sand)	ie	SP	10	3-4-4-4	From 16 to 18 feet Sieve Analysis
-	Boring terminated at 20 feet.					Sieve Passing
22-						Size %
24-						3/8" 100 No. 4 98.6 No. 10 97.3
26-						No. 20 91.4 No. 40 71.2
28-						No. 60 33.6 No. 100 14.6 No. 200 8.1
30-						Natural Moisture = 21.3
32-						
34						
36-						
38-						
40-						
42-						



## LOG OF BORING B-7

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 27, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Drilling Method:

***************************************	Project No.: JDH-10/16/279	Total Depth:	: 20	feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0 -	Light yellowish brown, wet, very loose, fine to SAND, with trace silt (10 YR 7/4, Sand)  Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/4, Sand)  Brownish yellow, wet, loose, fine to med with little to some silt (10 YR 6/6, Sandy)  Very pale brown, wet, medium dense, fine SAND, with trace silt (10 YR 7/3, Sand)  Very pale brown, wet, stiff, clayey SILT, to medium sand (10 YR 7/4, Silt loam)  Brownish yellow, wet, medium dense, fine SAND, with trace silt (10 YR 6/6, Sand)  Very pale brown, wet to saturated, medito medium SAND, with trace silt (10 YR 6/6, Sand)  Very pale brown, wet to saturated, medito medium SAND, with trace silt (10 YR 6/4, Sand)  Boring terminated at 20 feet.	ium SAND, ium SAND, loam) ne to medium with trace fine ne to medium um dense, fine 7/4, Sand)		SP SP SM SP ML SP SP SP	1 2 3 4 5 6 7 8 9 10	1-1-1-1 6-2-2-3 4-3-2-3 2-3-4-4 4-4-5-5 4-7-5-6 2-4-7-8 6-8-8-9 3-4-4-4 4-5-5-7	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered at the ground surface.  Groundwater was encountered at 17 feet during drilling operations.  Boring caved in at 14 feet.  Laboratory Test Results  Sample No. 2 From 2 to 4 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.8 No. 20 96.0 No. 40 79.3 No. 60 41.7 No. 100 15.1 No. 200 4.1  Natural Moisture = 3.6%  Sample No. 9 From 16 to 18 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 98.7 No. 20 89.6 No. 40 56.0 No. 40 56.0 No. 60 25.0 No. 100 12.7 No. 200 8.3  Natural Moisture = 19.2%
40 — 42 —							



## **LOG OF BORING B-8**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 27, 2016

Logged By: Drilled By: Drilling Method: : C. Johnston : M. Hynes

Inland	Baltimore, Maryland 21231  Bays Regional Wastewater Facilities		. Hynes SA (Geopi	robe 782	2 DT)		
man	Project No.: JDH-10/16/279	Drilling Method: Total Depth:		feet			
Depth in Feet	DESCRIPTION		GRAPHIC	uscs	Sample No.	Blows per 6 inches	Remarks
0-	Dark yellowish brown, wet, very loose, fi	ne to medium	1385		T		
2-	SAND, with trace silt (10 YR 4/4, Sand)	no to modium		SP	1	1-1-1-2	Scale 1" ~ 6.2 feet
4-	Light yellowish brown, wet, very loose, fi SAND, with trace silt (10 YR 6/4, Sand)	ne to medium		SP	2	1-1-1-1	Approximately 2 inches of organic bearing soil was encountered at the ground surface.
-					3	1-1-1-2	Groundwater was encountered at 18
6-	Light yellowish brown, wet, loose, fine to SAND, with trace silt (10 YR 6/4, Sand)	medium			4	2-3-3-3	feet during drilling operations.  Boring caved in at 15 feet.
8- - 10-				SP	5	3-3-4-4	Laboratory Test Results
10 - 12-				-	6	3-3-4-4	Sample No. 9 From 16 to 18 feet
-	Very pale brown, wet, medium dense, fill SAND, with trace silt (10 YR 7/3, Sand)	ne to medium		SP	7	3-4-5-6	Sieve Analysis
14- - 16-	Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/3, Sand)	ium SAND,		SP	8	4-4-5-5	Sieve Passing Size %
18-	Brownish yellow, wet, medium dense, fir SAND, with trace to little silt (10 YR 6/6,	Loamy sand)		SP-SM	9	3-3-6-6	No. 10 100 No. 20 99.8
20-	Yellow, wet to saturated, medium stiff, s trace fine to medium sand (10 YR 7/6, S	ilty CLAY, with ilty clay loam)		СН	10	2-3-5-5	No. 40 99.1 No. 60 86.3 No. 100 26.5
_	Boring terminated at 20 feet.						No. 200 12.4
22							Natural Moisture = 26.5%
24 <i>-</i>							Sample No. 10 From 18 to 20 feet
26-							Atterberg Limits
28-							Liquid Limit = 52 Plasticity Index = 26 Natural Moisture = 27.2%
30-							
32 <i>-</i>							
34 <i>-</i> -						<u> </u>	
36 -							:
38-							
40-							
42-		TABLE TO THE STATE OF THE STATE		·····			



## LOG OF BORING B-9

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Logged By:

Date Completed:

: September 20, 2016 : C. Johnston

Drilled By:

: B. Hynes

Inland	Inland Bays Regional Wastewater Facilities  Drilling Method:  Total Penth:			: HSA (Geoprobe 7822 DT) : 20 feet						
	Project No.: JDH-10/16/279	Total Depth:	: 20	feet	<u> </u>	I	1			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks			
0-	Light brown, wet, medium dense, fine to	medium SAND.			П <u>.</u> Т					
2-	with trace silt (Sand)			SP	1	4-4-7-9	Scale 1" ~ 6.2 feet			
4-	Orange-brown, wet, medium dense, fine SAND, with some silt (Sandy loam)	e to medium		SM	2	3-4-6-7	No organic bearing soil was encountered at the ground surface.			
_					3	7-7-7-7	Groundwater was encountered at 12 feet during drilling operations.			
6- - 8-	Light brown, wet, medium dense to loos medium SAND, with trace silt (Sand)	e, fine to		SP	4	8-4-6-8	Boring caved in at 10 feet.			
10-				<u> </u>	5	2-6-5-5	Laboratory Test Results Sample No. 2			
_	Gray-brown, wet to saturated, loose, fine SAND, with trace silt (Sand)	e to medium			6	8-3-4-5	From 2 to 4 feet			
12-				SP	7	2-3-3-3	Sieve Analysis			
14-	Orange-brown, saturated, loose, fine to with trace silt (Sand)	medium SAND,		SP	8	3-4-4-5	Sieve Passing Size %			
16-	Gray, saturated, loose, fine to medium S silt (Sand)	SAND, with trace			9	2-3-4-6	3/8" 100 No. 4 99.1			
18-	one (Odna)			SP	40	2010	No. 10 98.2 No. 20 93.1			
20-	Davis a terrainated at 20 feet				10	2-3-4-6	No. 40 72.2 No. 60 52.1			
-	Boring terminated at 20 feet.						No. 100 36.0 No. 200 25.3			
22-							Natural Moisture = 5.1%			
24-										
26-										
28-							,			
-										
30-						<del> </del>				
32-										
34-										
36-										
38-										
40-										
-										
42-										



## LOG OF BORING B-10

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 5, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inland	d Bays Regional Wastewater Facilities Drilling Method:		l. Hynes SA (Geop	robe 790	2 DT)	
mail	Project No.: JDH-10/16/279 Total Depth:		SA (Geop ) feet	1006 / 82	201)	
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
	Brown, wet, very loose to loose, fine to medium SAND, with trace silt (10 YR 5/3, Sand)			1	1-1-2-2	Scale 1" ~ 6.2 feet
2 - 4	•		SP	2	6-3-2-2	Approximately 6 inches of organic bearing soil was encountered at the ground surface.
6-	*			3	10-2-2-2	Groundwater was encountered at 8 feet during drilling operations.
8-	Pale brown, saturated, very loose, fine to medium			4	11-4-2-2	At completion water was at 6.5 feet; boring caved in at 7.5 feet.
10-	SAND, with trace to little silt (10 YR 6/3, Sand)		SP	5	3-2-2-2 1-1-1-2	Laboratory Test Results
12	Light gray, saturated, very loose to loose, fine to			7	1-1-1-2	Sample No. 5 From 8 to 10 feet
14-	medium SAND, with trace silt (10 YR 7/2, Loamy sand)			8	3-1-1-1	Sieve Analysis Sieve Passing
16-			SP-SM	9	1-2-4-4	Size %
18-				10	2-3-4-5	No. 4 100 No. 10 97.2 No. 20 92.3
20 - 22-	Boring terminated at 20 feet.					No. 40 52.3 No. 60 30.7 No. 100 17.3 No. 200 12.5
24-						Natural Moisture = 17.5%
26-						
28-						
30-						
32-						
34-						
36-						
38-						
40-						
42-						



## LOG OF BORING B-11

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 20, 2016

Logged By: Drilled By: : C. Johnston : B. Hynes

Drilling Method:

man	Project No.: JDH-10/16/279 Drilling Method:  Total Depth:		) feet	robe 782	201)	
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0— 2— 4— 6— 8— 10—	Light brown, wet to saturated, very loose to medium dense, fine to medium SAND, with trace silt (Sand)  Brown, saturated, soft, clayey SILT, with trace fine to medium sand (Silt loam)		SP ML	1 2 3 4 5 6	1-2-2-2 1-2-3-6 4-4-6-5 5-3-3-4 1-2-2-3 2-2-2-2	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered at the ground surface.  Groundwater was encountered at 10 feet during drilling operations.  Boring caved in at 11 feet.  Laboratory Test Results  Sample No. 8  From 14 to 16 feet
12— 14— 16— -	Grayish brown, saturated, loose, fine to medium SAND, with some silt (Sandy loam)  Orange-brown, saturated, medium dense, fine to medium SAND, with trace silt (Sand)  Orange-brown, saturated, medium dense, fine to coarse		SM	8 9	1-2-3-4 3-5-6-8 3-4-7-7	Sieve Analysis  Sieve Passing Size %  3/8" 100 No. 4 99.9 No. 10 99.1 No. 20 90.6
20— 22— 22— 24—	SAND, with trace silt (Sand)  Boring terminated at 20 feet.		SP	10	3-4-6-6	No. 40 56.9 No. 60 23.7 No. 100 10.2 No. 200 5.9 Natural Moisture = 19.8%
26 — 28 — 30 —						
32 — 34 — 36 — 38 —					,	
40 — 42 —						



## **LOG OF BORING B-12**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 26, 2016

Logged By: Drilled By: : C. Johnston : J. Briddell

Inland	Inland Bays Regional Wastewater Facilities  Project No.: JDH-10/16/279  Drilled By: Drilling Method: Total Depth:		: J. Briddell : HSA (Geoprobe 7822 DT) : 20 feet					
Depth in Feet	DESCRIPTION	, is an all a second	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks	
0-				SP	1	2-2-2-2	Scale 1" ~ 6.2 feet	
2-	Orange-brown, wet, very loose, fine to n with trace silt (Sand)	nedium SAND,		SP	2	2-2-2-3	No organic bearing soil was encountered at the ground surface.	
6-	Light brown, wet to saturated, very loose to medium SAND, with trace to little silt	e to loose, fine (Sand)		,	3	2-2-2-2	Groundwater was encountered at 7.5 feet during drilling operations.	
8-				SP	4	3-4-5-5	Boring caved in at 6 feet.	
10-					5	2-2-4-6	Laboratory Test Results Sample No. 5	
12-	Brown-gray, saturated, loose to very loo	so fine to		~~~~	6	7-5- <b>4</b> -6	From 8 to 10 feet Sieve Analysis	
14-	coarse SAND, with trace silt (Sand)	se, me to			7	3-5-5-5	Sieve Passing Size %	
16-				SP	8 9	2-2-4-4	No. 4 100 No. 10 99.4	
18-					10	1-1-1-3 2-3-4-6	No. 20 92.2 No. 40 59.5 No. 60 30.6	
20	Boring terminated at 20 feet.	- <del> </del>				2010	No. 100 19.3 No. 200 13.2	
22-							Natural Moisture = 17.5%	
24-								
26					<u> </u>			
28- - 30-								
32-								
34-								
36-								
38-								
40-								
42-								



## **LOG OF BORING B-13**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed: Logged By: : September 21, 2016

Drilled By:

: C. Johnston : B. Hynes

Inlan	Inland Bays Regional Wastewater Facilities Drilling Method:			: B. Hynes : HSA (Geoprobe 7822 DT)						
IIIIaii	Project No.: JDH-10/16/279	Total Depth:		on (Geop) Ofeet	1006 102	201)				
Depth in Feet	DESCRIPTION	Том Борин	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks			
0-	Light yellowish brown, wet, very loose, fi SAND, with trace to little silt (10 YR 6/4,	ne to medium Loamy sand)		SP-SM	1	1-2-2-2	Scale 1" ~ 6.2 feet			
4-	Very pale brown, wet, very loose, fine to SAND, with trace silt (10 YR 7/3, Sand)	medium		SP	2	1-2-2-3	No organic bearing soil was encountered at the ground surface.			
6-	Brownish yellow, wet, loose, fine to med with little to some silt (10 YR 6/6, Sandy	loam)		SM	3	3-4-4-5	Groundwater was encountered at 10 feet during drilling operations.			
8-	Very pale brown, wet, loose, fine to med with little to some silt (10 YR 7/3, Sandy	ium SAND, loam)		SM	4	2-2-3-3	Boring caved in at 11 feet.			
10-					5	2-3-4-4	Laboratory Test Results Sample No. 6			
12 14 16 18	Light gray, wet to saturated, very loose, SAND, with trace to little silt (10 YR 7/2,	Loamy sand)		SP-SM	6 7 8 9	2-2-2-3 3-2-3-4 2-3-3-4 2-2-3-4	From 10 to 12 feet  Sieve Analysis  Sieve Passing Size %  No. 10 100  No. 20 99.6  No. 40 93.2  No. 60 67.4			
20 — 22 — 24 — 26 —	Boring terminated at 20 feet.				10	1-2-4-5	No. 100 30.3 No. 200 18.3 Natural Moisture = 25.5%			
20 — 28 — 30 — 32 — 34 — 36 — 38 — 40 — 42 —										



## LOG OF BORING B-14

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Bays Regional Wastewater Facilities

Date Completed:

: October 5, 2016

Logged By:

: C. Johnston

Drilled By: Drilling Method: : M. Hynes : HSA (Geoprobe 7822 DT)

Inland Bays Regional Wastewater Facilities Drilling Method:		: HSA (Geoprobe 7822 DT) : 20 feet					
Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		1		
DESCRIPTION	ı	GRAPHIC	uscs	Sample No.	Blows per 6 inches	Remarks	
Pale brown, wet, very loose to loose, fine to with some silt, little clay (10 YR 6/3, Sand)  Pale brown, wet, medium dense, fine to with some silt, little clay (10 YR 6/3, Sand)  Light gray, saturated, loose, fine to me trace silt (10 YR 7/2, Sand)  Light gray, saturated, loose, fine to me little silt, trace clay (10 YR 7/2, Loamy sand)  Brownish yellow, saturated, loose, fine SAND, with trace to little silt (10 YR 6/6)  Boring terminated at 20 feet.  22- 24- 26- 28- 30- 32- 34- 36- 38- 40-	o medium SAND, indy loam) dium SAND, with dium SAND, with sand)	GR	SP SP-SM SP	1 2 3 4 5 6 7 8 9 10	2-2-2-2 6-1-2-2 9-3-3-3 10-6-6-5 4-4-3-3 2-2-4-4 2-2-4-4 3-3-3-3 4-3-3-2	Scale 1" ~ 6.2 feet  Approximately 6 inches of organic bearing soil was encountered at the ground surface.  Groundwater was encountered at 8 feet during drilling operations.  At completion water was at 6.5 feet; boring caved in at 7.5 feet.  Laboratory Test Results  Sample No. 9  From 16 to 18 feet  Sieve Passing Size %  No. 4 100  No. 10 99.9  No. 20 96.5  No. 40 73.2  No. 60 73.2  No. 100 16.8  No. 200 11.8  Natural Moisture = 20.5%	
42-							



## **LOG OF BORING B-15**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 21, 2016

Logged By: Drilled By: : C. Johnston : B. Hynes

Drilling Method:

Inlan	d Bays Regional Wastewater Facilities Project No.: JDH-10/16/279	Drilling Method: Total Depth:		SA (Geop 0 feet	robe 782	2 DT)	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0- - 2-	Pale brown, wet, very loose, fine to med trace to little silt (10 YR 6/3, Loamy sand	d)		SP-SM	1	1-1-2-2	Scale 1" ~ 6.2 feet
4-	Brownish yellow, wet, loose, fine to med with little to some silt (10 YR 6/6, Sandy			SM	2	1-2-3-5	No organic bearing soil was encountered at the ground surface.
6	Very pale brown, wet, loose, fine to med with little to some silt (10 YR 7/3, Sandy			SM	3	3-4-3-4	Groundwater was encountered at 9 feet during drilling operations.
-	Yellow, wet, very loose, fine to coarse S trace silt (10 YR 7/6, Sand)	AND, with		SP	4	1-1-1-1	Boring caved in at 9.5 feet.
8-	Light gray, wet to saturated, very loose, SAND, with trace to little silt (10 YR 7/1,	fine to coarse Loamy sand)			5	WOH/18"-1	Laboratory Test Results
10-				SP-SM	6	1-2-4-4	Sample No. 5 From 8 to 10 feet
12	Light gray, saturated, loose, fine to coar trace silt (10 YR 7/1, Sand)	se SAND, with		SP	7	1-2-3-4	Sieve Analysis
14-	Light gray, saturated, loose, fine to med trace to little silt (10 YR 7/2, Loamy sand	ium SAND, with		SP-SM	8	1-2-3-3	Sieve Passing Size %
16-	Very pale brown, saturated, loose, fine t SAND, with some silt (10 YR 7/3, Sandy	o medium (loam)		SM	9	2-2-2-3	3/8" 100 No. 4 98.2 No. 10 96.1
18 -	Very pale brown, saturated, loose, fine t SAND, with trace to little silt (10 YR 7/3,	o coarse		SP-SM	10	2-2-3-4	No. 20 88.1 No. 40 66.0
20 –	Boring terminated at 20 feet.				L		No. 60 40.7 No. 100 20.5 No. 200 13.0
22-							Natural Moisture = 19.9%
24-							Sample No. 8 From 14 to 16 feet
26-							Sieve Analysis
28-							Sieve Passing Size %
30-		. •					3/8" 100
32-							No. 4 99.4 No. 10 99.1 No. 20 94.1
34-							No. 40 85.2 No. 60 42.8
- 36							No. 100 17.1 No. 200 11.5
- 38-						·	Natural Moisture = 25.5%
- 40							
40 - 42-			<u> </u>				
44_							



## LOG OF BORING B-16

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 21, 2016

Logged By: Drilled By:

: C. Johnston : B. Hynes

Inland	Inland Bays Regional Wastewater Facilities Drilling Method:			. Hynes SA (Geopt	robe 782	2 DT)	
	Project No.: JDH-10/16/279	Total Depth:	: 20	0 feet		•	
Depth in Feet	DESCRIPTION		GRAPHIC	USCS	Sample No.	Blows per 6 inches	Remarks
0-	0			1	TT	T	<u> </u>
2-	Pale brown, wet, very loose, fine to med little to some silt, trace clay (10 YR 6/3, \$	Sandy Ioam)		SM	1	1-2-2-2	Scale 1" ~ 6.2 feet
-	Pale brown, wet, loose, fine to medium S to some silt, trace clay (10 YR 6/3, Sand			SM	2	1-3-3-4	No organic bearing soil was encountered at the ground surface.
4-	Very pale brown, wet, loose, fine to med with some silt, trace clay (10 YR 7/3, Sar			SM	3	3-3-4-5	Groundwater was encountered at 9 feet during drilling operations.
6-	Very pale brown, wet, very loose, fine to with little silt (10 YR 7/3, Sandy loam)	coarse SAND,		SM	4	2-3-2-3	Boring caved in at 10 feet.
8-	Light gray, wet to saturated, very loose, SAND, with trace to little silt (10 YR 7/1,	fine to coarse Loamy sand)		SP-SM	5	1-2-2-3	Laboratory Test Results
10 -	White, saturated, very loose, fine to med little to some silt (10 YR 8/1, Sandy loam	lium SAND, with		SM	6	1-2-2-2	Sample No. 5 From 8 to 10 feet
12- -	Light gray, saturated, loose, fine to coars trace to little silt (10 YR 7/2, Sand)	se SAND, with			7	1-2-3-4	Sieve Analysis
14 <i>-</i> -	,			SP	8	2-2-2-3	Sieve Passing Size %
16-	Very pale brown, saturated, very loose, f SAND, with trace to little silt (10 YR 7/3,			SP-SM	9	1-2-2-2	3/8" 100 No. 4 99.9 No. 10 98.7
18	Light gray, saturated, loose, fine to medi trace to little silt (10 YR 7/2, Loamy sand			SP-SM	10	1-2-2-4	No. 20 90.1 No. 40 61.2 No. 60 33.1
20- 22- 24- 26- 28- 30- 32- 34- 36- 38-	Boring terminated at 20 feet.						No. 60 33.1 No. 100 17.9 No. 200 12.5  Natural Moisture = 20.0%  Sample No. 7 From 12 to 14 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.6 No. 20 96.4 No. 40 64.0 No. 60 22.2 No. 100 10.6 No. 200 7.0  Natural Moisture = 26.0%
40-			<u></u>				
42-	i.						



## LOG OF BORING B-17

(Page 1 of 1)

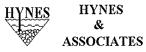
Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 16, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

Project No.: JDH-10/16/279  DESCRIPTION  DES	Inland	d Bays Regional Wastewater Facilities	Drilled By: Drilling Method:		. Hynes SA (Geop	robe 782	22 DT)	
DESCRIPTION  DESCR	man		-			1006 702	.201)	
Light yellowish brown, wet, loose, fine to medium SAND, with little to some silt, frace clay (10 YR 6/6, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  SM 4 5-58  Groundwater was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Seale 1" - 6.2 feet  No organic beginn soll was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Seale 1" - 6.2 feet  No organic beginn soll was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Sieve Passing Size 9  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  Person 10 to 12 feet  Sieve Passing Size 9  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  Boring terminated at 20 feet.  SM 10 10 100 No. 20 96 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 20 96.5 No. 20 96.	Depth in Feet					Sample No.	Blows per 6 inches	Remarks
Light yellowish brown, wet, loose, fine to medium SAND, with little to some silt, frace clay (10 YR 6/6, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  SM 4 5-58  Groundwater was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Seale 1" - 6.2 feet  No organic beginn soll was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Seale 1" - 6.2 feet  No organic beginn soll was encountered at 9 feet during drilling operations.  At completion water was at 10 feet; boring caved in at 11 feet.  Laboratory Test Results  Sample No. 6  Form 10 to 12 feet  Sieve Passing Size 9  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  Person 10 to 12 feet  Sieve Passing Size 9  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  Boring terminated at 20 feet.  SM 10 10 100 No. 20 96 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 100 26.1 No. 20 96.5 No. 60 67.0 No. 20 96.5 No. 20 96.	0-			<u> </u>	·	· · · · · · · · · · · · · · · · · · ·		
Brownish yellow, wet, medium dense, fine to medium SAND, with little to some sit, trace clay (10 YR 6/6, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some sit (10 YR 7/4, Sandy loam)  Very pale brown, wet, loose, fine to medium SAND, with little to some sit (10 YR 7/4, Sandy loam)  SM 5  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some sit (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some sit (10 YR 7/6, Loarny sand)  SM 5  SM 5  SM 5  SM 5  SP-SM 7  SP-SM 7  SS-6-7  Seve Analysis  Seve Passing Size %  No. 10 10 No. 20 99.6 No. 40 99.6	-	Light yellowish brown, wet, loose, fine to r SAND, with some silt (10 YR 6/4, Sandy I	medium loam)		SM	1	3-4-4-5	Scale 1" ~ 6.2 feet
Very pale brown, wet, loose, fine to medium SAND, with little to some slit (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some slit (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some slit (10 YR 7/6, Loamy sand)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some slit (10 YR 7/6, Loamy sand)  SM 5  12-6-5  Laboratory Test Results  Sample No. 6 From 10 to 12 feet  SP-SM 7  Selve Analysis  Sieve	-	SAND, with little to some silt, trace clay (1			SM	2	4-5-5-7	at the ground surface.
Very pale brown, wet, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with little to some silt (10 YR 7/4, Sandy loam)  SP-SM  7  SP-SM  7  SP-SM  7  SP-SM  7  SP-SM  7  SP-SM  8  Wellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  9  3-3-4-7  No. 10 100 No. 20 99.6 No. 60 67.0 No. 100 96.4 No. 100 16.7 No. 100 16.7 Natural Moisture = 30.3%  10  32- 34- 36- 38- 40-	6					3	4-5-5-8	1
medium SAND, with little to some silt (10 YR 7/4, Sandy   SM   SM   SM   SM   SM   SM   SM   S	-	with little to some silt (10 YR 7/4, Sandy l	oam)		SM	4	12-6-5-1	
Yellow, saturated, medium dense, fine to coarse SAND, with trace to little silt (10 YR 7/6, Loamy sand)  SP-SM  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  SM  SP-SM  Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  SM  SM  10  SP-SM  Sieve Passing Size %  No. 10 100 No. 20 99.6 No. 40 96.4 No. 50 67.0 No. 100 26.1 No. 200 16.7 Natural Moisture = 30.3%  Natural Moisture = 30.3%  Natural Moisture = 30.3%  Natural Moisture = 30.3%	- 10-	medium SAND, with little to some silt (10	fine to YR 7/4, Sandy		SM	5	12-6-5-5	Laboratory Test Results
SP-SM   7   5-5-5-6   Sieve Analysis	-	Yellow, saturated, medium dense, fine to	coarse SAND, sand)			6	5-5-6-7	
16	_				SP-SM	7	5-5-5-6	Sieve Analysis
Yellow, saturated, medium dense, fine to medium SAND, with little to some silt (10 YR 7/6, Sandy loam)  SM	_					8	4-5-5-5	
Boring terminated at 20 feet.    10	-	Yellow, saturated, medium dense, fine to with little to some silt (10 YR 7/6, Sandy k	medium SAND, oam)		CM	9	3-3-4-7	No. 20 99.6
Boring terminated at 20 feet.  No. 200 16,7 Natural Moisture = 30.3%  28- 30- 32- 34- 36- 38- 40-	-				SIVI	10	3-3-5-6	No. 60 67.0
24- 26- 28- 30- 32- 34- 36- 38- 40-	20-	Boring terminated at 20 feet.				L		:
26 28- 30- 32- 34- 36- 38- 40-	22 -							Natural Moisture = 30.3%
28- 30- 32- 34- 36- 38- 40-	24 <i>-</i> -							
30- 32- 34- 36- 38- 40-	26-							
32- 34- 36- 38- 40-	28-							
34- 36- 38- 40-	30-							
36 – 38 – 40 –	32-							
38 – 40 – -	34-							
- 40- -	36-							
	38-							
42-	40-							
	42-							



## LOG OF BORING B-18

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 19, 2016

Logged By: Drilled By: : C. Johnston

: B. Hynes

Inland	Inland Bays Regional Wastewater Facilities Drilling Method:		: HSA (Geoprobe 7822 DT)					
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		1		
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks	
0- 2- -	Very pale brown, wet, medium dense, fi SAND, with trace silt (Sand)	ne to medium		SP	1 2	4-5-5-6 4-5-5-7	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered at the ground surface.	
4-	Yellowish brown, wet, medium dense, fill SAND, with little to some silt (10 YR 5/6	ne to medium , Sandy loam)		SM	3	7-8-7-9	Groundwater was encountered at 13 feet during drilling operations.	
6 8	Light yellowish brown, wet, medium den medium SAND, with little to some silt (19 Joam)	se, fine to 0 YR 6/4, Sandy		SM	4	7-8-6-7	Boring caved in at 12 feet.	
10-	Pale brown, wet, stiff, silty CLAY, with transcript medium sand (10 YR 6/3, Silty clay loan	ace fine to		CL	5	4-7-6-7	Laboratory Test Results Sample No. 5	
12-	Light gray, wet, very stiff, silty CLAY, wit medium sand (10 YR 7/2, Silty clay loan	h trace fine to		CL	6	6-8-10-12	From 8 to 10 feet	
14-	Light gray, wet to saturated, medium de coarse SAND, with trace silt (10 YR 7/2,	Sand)		SP	7	3-8-11-8	Atterberg Limits  Liquid Limit = 41	
16-	Very pale brown, saturated, medium de medium SAND, with trace to little silt (10 sand)			SP-SM	8	2-6-7-6	Plasticity Index = 17 Natural Moisture = 21.6%	
18-	Light gray, saturated, medium dense, fir SAND, with trace to little silt (10 YR 7/2,	ne to medium Loamy sand)		SP-SM	9	3-5-5-7	Sample No. 8 From 14 to 16 feet	
20-					10	4-6-7-8	Sieve Analysis	
22-	Boring terminated at 20 feet.					**************************************	Sieve Passing Size %	
- 24							No. 4 100 No. 10 99.7 No. 20 97.2	
26 <del>-</del>							No. 40 73.3 No. 60 38.6 No. 100 15.0 No. 200 7.0	
28-							Natural Moisture = 19.4%	
30-								
32-			L	<u> </u>		<u>L</u>		
34- -								
36-								
38- -								
40-								
42-							U	



## **LOG OF BORING B-19**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Drilled By:

Date Completed:

: September 21, 2016

Logged By:

: C. Johnston : B. Hynes

Inlan	Inland Bays Regional Wastewater Facilities Drilling Method:		: B. Hynes : HSA (Geoprobe 7822 DT)						
	Project No.: JDH-10/16/279	Total Depth:	: 20	feet					
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks		
0-	Light yellow brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/4, Sand)			SP	1	1-2-2-3	Scale 1" ~ 6.2 feet		
2	Brownish yellow, wet, very loose, fine to SAND, with trace silt, trace clay (10 YR	medium 6/6, Sandy		SM	2	1-2-2-2	No organic bearing soil was encountered at the ground surface.		
4- 6-	loam) Yellow, wet, loose, fine to medium SANI silt, trace clay (10 YR 7/6, Sandy loam)	D, with some		SM	3	2-3-3-5	Groundwater was encountered at 11 feet during drilling operations.		
- 8-	Light gray, wet, loose, fine to medium S silt (10 YR 7/6, Sand)	AND, with trace		SP	4	2-4-4-3	Boring caved in at 11 feet.		
10-	Light gray, wet, very loose, fine to media some silt, trace clay (10 YR 7/2, Sandy	um SAND, with loam)		SM	5	2-3-2-3	Laboratory Test Results Sample No. 6		
10-	Light gray, wet to saturated, loose, fine to coarse SAND, with trace silt (10 YR 7/1, Sand)			SP	6	2-3-3-4	From 10 to 12 feet		
_	Light gray, saturated, loose, fine to med little to some silt (10 YR 7/2, Sandy loan	ium SAND, with n)		SM	7	2-2-4-5	Sieve Analysis Sieve Passing		
14 - 16	Light gray, saturated, loose, fine to coar trace silt (10 YR 7/1, Sand)	se SAND, with		SP	8	2-3-4-4	Size %  3/8" 100  No. 4 98.9		
18-	Light areas actuated loos fine to modium CANID with				9	2-2-4-4	No. 10 97.6 No. 20 88.6		
20-	Light gray, saturated, loose, fine to medium SAND, with little to some silt, trace fine gravel (10 YR 7/2, Sandy loam)			SM	10	1-3-4-5	No. 40 53.6 No. 60 23.4 No. 100 13.6		
22-	Boring terminated at 20 feet.						No. 200 9.5  Natural Moisture = 19.5%		
24-						•	Sample No. 9 From 16 to 18 feet		
26-							Sieve Analysis		
28-							Sieve Passing Size %		
30-							3/4" 100 1/2" 97.8		
32-	2-						3/8" 97.8 No. 4 94.2		
34-	-						No. 10 77.9 No. 20 52.6 No. 40 26.7		
36-	<b>}</b> −					ACCEPTANCE OF THE PROPERTY OF	No. 60 14.1 No. 100 7.9 No. 200 5.2		
38-							Natural Moisture = 12.8%		
40-									
42-					<u> </u>				



## LOG OF BORING B-20

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

& Associates, LLP Date Completed:

Logged By:

: September 21, 2016 : C. Johnston

rilled By: : B. Hyne

Inland Bays Regional Wastewater Facilities Project No.: JDH-10/16/279  DESCRIPTION	
DESCRIPTION  DESCR	
Pale brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)  Light yellowish brown, wet, very loose, fine to medium SAND, with little to some silt, trace clay (10 YR 6/4, Sandy loam)  Pale brown, wet, loose, fine to medium SAND, with SP 3 1-3-3-3 Groundwater was encountered silt (10 YR 6/3, Sand)  Very pale brown, wet, loose, fine to medium SAND, SM 4 2-3-4-5 Boring caved in at 10.5 fine to medium SAND, SM 5 Boring cav	
Pale brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)  Light yellowish brown, wet, very loose, fine to medium SAND, with little to some silt, trace clay (10 YR 6/4, Sandy loam)  Pale brown, wet, loose, fine to medium SAND, with SP 3 1-3-3-3 Groundwater was encounted trace silt (10 YR 6/3, Sand)  Very pale brown, wet, loose, fine to medium SAND, SM 4 2-3-4-5 Boring caved in at 10.5 fine to	ks
Light yellowish brown, wet, very loose, fine to medium SAND, with little to some silt, trace clay (10 YR 6/4, Sandy loam)  Pale brown, wet, loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)  Very pale brown, wet, loose, fine to medium SAND,	
Pale brown, wet, loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)  Very pale brown, wet, loose, fine to medium SAND,  SM 4 2:34-5  Boring caved in at 10.5 from the caved in at 10.5 from t	was encountered
Very pale brown, wet, loose, fine to medium SAND, SM 4 2345 Boring caved in at 10.5 f	
with little to some silt, trace clay (10 YR 7/3, Sandy loam)  8 - Vith little to some silt, trace clay (10 YR 7/3, Sandy Laboratory Test Results	
Very pale brown, wet to saturated, loose, fine to  10 medium SAND, with little to some silt (10 YR 8/2, Sandy  Sample No. 7  From 10 to 14 foot	
Light gray, saturated, loose, fine to medium SAND, with some silt (10 YR 7/2, Sandy loam)  SM 6 1-2-2-3 From 12 to 14 feet Sieve Analysis	
Light gray, saturated, loose, fine to coarse SAND, with trace silt (10 YR 7/2, Sand)  Sieve Passing Size %	
SP   3/8" 100 No. 4 99.5	
18— No. 10 98.9 No. 20 87.0 No. 40 37.5	
20   No. 60 18.7 No. 100 10.9 No. 200 7.6	
Natural Moisture = 25.49	%
24-	
26	
30-	
32 –	
34-	
36-	
38-	
40-	
42-	



## LOG OF BORING B-21

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 20, 2016

Logged By: Drilled By:

: C. Johnston : B. Hynes

Inland	Inland Bays Regional Wastewater Facilities Drilling Method:		: HSA (Geoprobe 7822 DT)					
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		T		
Depth in Feet	DESCRIPTION		GRAPHIC	uscs	Sample No.	Blows per 6 inches	Remarks	
0-	Pale brown, wet, very loose, fine to medium SAND, with little to some silt, trace clay (10 YR 6/3, Sandy loam)			SM	1	2-2-2-3	Scale 1" ~ 6.2 feet	
2-	Pale brown, wet, loose, fine to medium to some silt, trace clay (10 YR 6/3, Sand	SAND, with little ly loam)		SM	2	2-3-3-4	No organic bearing soil was encountered at the ground surface.	
6-	Very pale brown, wet, loose, fine to med with little to some silt, trace clay (10 YR loam)	lium SAND, 7/4, Sandy		SM	3	2-2-4-6	Groundwater was encountered at 14 feet during drilling operations.	
8-	Light gray, wet, loose, fine to medium S. silt, trace clay (10 YR 5/2, Sandy loam)	AND, with little		SM	4	2-2-3-5	At completion water was at 12 feet; boring caved in at 13 feet.	
10-	Light gray, wet, medium dense, fine to n with little silt, trace clay (10 YR 5/2, San	dy loam)		SM	5	2-2-5-6	Laboratory Test Results	
12-	Light gray, wet, loose, fine to medium S. silt, trace clay (10 YR 5/2, Sandy loam)			SM	6	2-3-3-5	Sample No. 7 From 12 to 14 feet	
14-	Very pale brown, wet to saturated, loose medium SAND, with some silt (10 YR 8/			SM	7	2-2-2-3	Sieve Analysis	
16-					8	3-3-4-4	Sieve Passing Size %	
18-	Light gray, saturated, loose, fine to coar trace silt (10 YR 7/1, Sand)			SP	9	2-2-4-4	No. 4 100 No. 10 99.8	
20-	Light gray, saturated, medium dense, fir SAND, with little to some silt (10 YR 7/2			SP-SM	10	2-3-5-6	No. 20 97.8 No. 40 88.2 No. 60 78.8	
22-	Boring terminated at 20 feet.						No. 100 41.3 No. 200 25.8	
-							Natural Moisture = 26.1%	
24-						***************************************		
26-								
28-								
30-								
32-								
34-						•		
36-								
38-								
40-								
42-		·····			<del></del>			



## LOG OF BORING B-22

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 20, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inland	Inland Bays Regional Wastewater Facilities Drilling Method:			SA (Geopr	obe 782	2 DT)	
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)	lium SAND, with		SP	1	1-1-2-3	Scale 1" ~ 6.2 feet
2- - 4-	Yellowish brown, wet, very loose to loos medium SAND with trace silt (10 YR 5/6	e, fine to i, Sand)		SP	2	1-2-2-3	Approximately 4 inches of organic bearing soil was encountered at the ground surface.
6-	Brown, wet, loose to medium dense, fine	e to medium			3	2-3-4-6	Groundwater was encountered at 14 feet during drilling operations.
- 8-	SAND, with trace silt (10 YR 5/3, Sand)	e to medium		SP	4	3-3-4-6	At completion water was at 14 feet; boring caved in at 17 feet.
10 <i>-</i> -	Brown, wet, very loose, fine to medium	SAND, with little		SP-SM	5	3-5-6-8 1-2-2-3	Laboratory Test Results
12- -	silt, trace clay (10 YR 5/3, Loamy sand) Light grayish brown, wet, medium stiff, 5 fine sand, trace clay (10 YR 6/2, Silt loa	SILT, with little		ML	7	2-3-4-5	Sample No. 7 From 12 to 14 feet
14-	Light gray, saturated, medium stiff, silty trace fine sand (10 YR 7/2, Silty clay loa	CLAY, with		СН	8	2-4-4-4	Sieve Analysis Sieve Passing
16- - 18-	Pale brown, saturated, medium dense, fine to coarse SAND, with trace silt, trace clay (10 YR 6/3, Sand)			SP	9	2-4-9-9	Size
20 –					10	2-3-10-12	No. 10 99.9 No. 20 99.8
22-	Boring terminated at 20 feet.						No. 40 99.2 No. 60 96.8 No. 100 92.0
24-							No. 200 82.3  Natural Moisture = 21.1%
26 <del>-</del>							
28-				LL		1	
30-							
32 -							
34 <i>-</i> -							
36-							
38 40							
42 —							·



## **LOG OF BORING B-23**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed: Logged By: : September 21, 2016 : C. Johnston

Drilled By:

: B. Hynes

<u> </u>	Baitimore, Maryland 21231	: B. Hynes : HSA (Geoprobe 7822 DT)						
Inlan	d Bays Regional Wastewater Facilities	Drilling Method:			robe 782	2 DT)		
<b></b>	Project No.: JDH-10/16/279	Total Depth:	: 20	feet	т	·		
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks	
0-	Devisits allowed and lead fine to		15555		п	T		
2	Brownish yellow, wet, very loose, fine to SAND, with trace silt (10 YR 6/6, Sand)	medium		SP	1 2	1-2-2-2 2-3-2-2	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered at the ground surface.	
4-	Very pale brown, wet, loose, fine to med	lium SAND.					Groundwater was encountered at 13	
6-	with trace silt (10 YR 7/3, Sand)			SP	3	3-2-3-5	feet during drilling operations.	
	Light gray, wet, medium dense, fine to n with trace silt (10 YR 7/2, Sand)	nedium SAND,		SP	4	4-3-6-7	Boring caved in at 11 feet.	
8-	Very Pale brown, wet, medium dense, fi SAND, with trace silt (10 YR 7/3, Sand)	ne to medium			5	2-4-6-6	Laboratory Test Results	
10-				SP	6	3-4-5-6	Sample No. 3 From 4 to 6 feet	
12-	Light gray, wet to saturated, loose, fine to SAND, with little to some silt (10 YR 7/2				7	2-2-3-4	Sieve Analysis	
14-	(******************	,,		SM	8	1-2-3-4	Sieve Passing Size %	
16-	Light gray, saturated, loose, fine to coar trace silt (10 YR 7/2, Sand)	se SAND, with		SP	9	4-3-3-4	No. 4 100 No. 10 99.9 No. 20 98.0	
18-	Light gray, saturated, loose, fine to med little to some silt (10 YR 7/1, Sandy loan	ium SAND, with		SM	10	4-2-4-5	No. 40 67.1 No. 60 23.0 No. 100 4.5	
20-	Boring terminated at 20 feet.		1.1		<u> </u>		No. 100 4.5 No. 200 1.9	
22-							Natural Moisture = 3.5%	
24-							Sample No. 7 From 12 to 14 feet	
26-							Sieve Analysis	
28-							Sieve Passing Size %	
30-							No. 4 100 No. 10 99.5	
32-							No. 20 94.4 No. 40 61.2 No. 60 26.4	
34-							No. 100 14.7 No. 200 10.8	
36-							Natural Moisture = 22.4%	
38-								
40-								
42-								



## **LOG OF BORING B-24**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 20, 2016

Logged By: Drilled By:

: C. Johnston : B. Hynes

Inlan	d Bays Regional Wastewater Facilities Drilling Method:	: B. Hynes : HSA (Geoprobe 7822 DT)							
Project No.: JDH-10/16/279 Total Depth:			: NSA (Geoplobe 7022 D1) : 20 feet						
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks			
0-		I SEE	1	· · · · · · · · · · · · · · · · · · ·	I				
2- -	Pale brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)		SP	2	2-2-3-3 2-2-3-3	Scale 1" ~ 6.2 feet  Approximately 6 inches of organic bearing soil was encountered at the			
4-	Light yellowish brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/4, Sand)		SP	3	2-2-2-3	ground surface.  Groundwater was encountered at 16			
6- - 8-	Yellowish brown, wet, loose to medium dense, fine to medium SAND, with trace silt (10 YR 5/6, Sand)		SP	4	6-4-4-6	feet during drilling operations.  Boring caved in at 15 feet.			
- 10-			<u> </u>	5	2-5-6-8	Laboratory Test Results			
12-	Light brownish gray, wet, mediumd stiff, silty CLAY, with trace fine sand (10 YR 6/2, Silty clay loam)		CL	6	2-3-3-3	Sample No. 7 From 12 to 14 feet			
14-	Light brownish gray, wet, medium stiff, clayey SILT, with trace fine sand (10 YR 6/2, Silt loam)		ML	7	2-3-5-6	Sieve Analysis			
16-	Brown, wet, medium stiff, silty CLAY, with trace fine sand (10 YR 5/3, Silty clay loam)		CL	8	2-4-4-5	Sieve Passing Size %			
- 18	Pale brown, saturated, loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)		SP	9	3-4-4-4	3/8" 100 No. 4 99.9 No. 10 99.6			
20 –				10	3-4-5-6	No. 20 99.2 No. 40 97.9			
22-	Boring terminated at 20 feet.					No. 60 92.1 No. 100 79.9 No. 200 65.4			
24 <del>-</del>						Natural Moisture = 22.0%			
- 26									
28 <i>-</i> -									
30 <i>-</i> -									
32 <del>-</del>									
34 <i>-</i> -									
36 <del>-</del>									
- 38-									
40-									
42-		······································		<del></del>					



## **LOG OF BORING B-25**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 11, 2016

Logged By: Drilled By:

: M. Spino : M. Hynes

Inland Bays Regional Wastewater Facilities Drilling Method:

Project No.: JDH-10/16/279 Total Depth: : HSA (Geoprobe 7822 DT)

: 20 feet

	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet	***************************************		· · · · · · · · · · · · · · · · · · ·
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Light yellowish brown, wet, very loose, fit SAND, with trace to little silt (10 YR 6/4,	ne to medium Loamy sand)		SP-SM	1	1-1-1-1	Scale 1" ~ 6.2 feet
2- 4-	Light yellowish brown, wet, very loose, fi SAND, with some silt, trace clay (10 YR Joam)			SM	2	1-1-1-2	No organic bearing soil was encountered at the ground surface.
6-	Very pale brown, wet to saturated, very I coarse SAND, with little to some silt, little			SM	3	1-2-2-3	Groundwater was encountered at 6 feet during drilling operations.
8-	\7/3, Sandy loam)  Very pale brown, saturated, loose, fine to SAND, with trace silt, trace clay (10 YR 7)	o coarse 7/3, Sandy		SP	4	2-3-4-4	At completion water was at 6 feet; boring caved in at 11.5 feet.
	loam)  Very pale brown, saturated, loose, fine to	o coarse		SP	5	2-3-4-4	Laboratory Test Results
12	SAND, with trace silt (10 YR 7/4, Sand) White, saturated, loose, fine to coarse S. to little silt (10 YR 8/1, Loamy sand)	AND, with trace		SP-SM	6	2-4-4-4	Sample No. 8 From 14 to 16 feet
14-	Very pale brown, saturated, loose, fine to SAND, with some silt, little clay (10 YR 8			SM	7	2-3-4-4	Sieve Analysis Sieve Passing
16-	White, saturated, very loose, fine to med trace to little silt (10 YR 8/1, Sand)	lium SAND, with		0.0	8	3-2-2-3	Size % No. 4 100
18-				SP	10	2-3-3-3 2-2-3-3	No. 10 99.7 No. 20 99.3 No. 40 94.7
20-	Boring terminated at 20 feet.		100,516		L		No. 60 41.9 No. 100 21.4 No. 200 17.7
22-							Natural Moisture = 23.8%
24-							
26-				,			
28	ANT BERTHANDER AND						
30-							
32-							
34-							
36-							
38-							
40-							
42-				ummi = auto = m iii			



## LOG OF BORING B-26

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 11, 2016

Logged By: Drilled By: : M. Spino : M. Hynes

Inland Bays Regional Wastewater Facilities  Project No.: JDH-10/16/279  Drilling Method: Total Depth:		: HSA (Geoprobe 7822 DT) : 20 feet					
Depth in Feet	DESCRIPTION	700.2500	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0- - 2-	Dark yellowish brown, wet, very loose, fi SAND, with some silt, trace clay (10 YR	ne to medium 4/6, Sandy		SM	1	1-1-1-1	Scale 1" ~ 6.2 feet
4-	(loam) Light yellowish brown, wet, very loose, fi SAND, with trace silt (10 YR 6/4, Sand)	ne to coarse	1	SP	2	1-1-2-2	No organic bearing soil was encountered at the ground surface.
6-					3	1-2-2-2	Groundwater was encountered at 6 feet during drilling operations.
8-	Very pale brown, wet to saturated, loose coarse SAND, with trace silt (10 YR 7/3,	s, fine to Sand)			4	2-2-3-3	At completion water was at 4 feet; boring caved in at 5.5 feet.
10-				SP	5	2-4-4-5	Laboratory Test Results
12-	Light around the land to land	fine to an area			6	2-3-4-5	Sample No. 10 From 18 to 20 feet
14-	Light gray, saturated, very loose to loose SAND, with trace silt (10 YR 7/2, Sand)	e, fille to coarse			7	2-2-2-3	Sieve Analysis
- 16-				SP	8	2-2-3-3	Sieve Passing Size %
- 18-	Light gray, saturated, very soft, silty CLA	V with trace			9	1-1-2-2	3/8" 100 No. 4 99.7 No. 10 98.1
20-	fine to medium sand (10 YR 7/1, Silty cla Boring terminated at 20 feet.	ay)	14	CL	10	1-1-1-1	No. 20 97.1 No. 40 93.3
22-	bonng terminated at 20 feet.						No. 60 88.3 No. 100 83.1 No. 200 78.6
24-							Natural Moisture = 25.9%
- 26-							
28-			,				
30-							
32-							
34-							
36-							
38-							
40-							
42-							



## **LOG OF BORING B-27**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: October 10, 2016

Logged By: Drilled By:

: J. Lindsey : M. Hynes

Drilling Method:

	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0 12 14 18 1	Brown, wet, very loose, fine to medium Strace silt (10 YR 5/3, Sand)  Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)  Light gray, saturated, very loose, fine to with trace silt (10 YR 7/2, Sand)  Brown, saturated, very loose, fine to med with little silt (10 YR 5/3, Loamy sand)  Yellowish brown, saturated, very loose, f SAND, with trace silt (10 YR 5/4, Sand)  Boring terminated at 20 feet.	ium SAND, with medium SAND,		SP SP-SM SP-SM	1 2 3 4 5 6 7 8 9 10	1-1-1-2 1-1-2-1 1-2-2-2 1-2-2-3 1-2-2-3 1-2-3-4 1-2-2-3 2-2-3-5 1-2-3-5	Scale 1" ~ 6.2 feet  Approximately 2 inches of organic bearing soil was encountered at the ground surface.  Groundwater was encountered at 7 feet during drilling operations.  At completion water was at 5.5 feet; boring caved in at 6.5 feet.  Laboratory Test Results  Sample No. 7 From 12 to 14 feet  Sieve Analysis  Sieve Passing Size %  No. 10 100  No. 20 99.9  No. 40 98.9  No. 60 58.3  No. 100 13.5  No. 200 8.5  Natural Moisture = 32.0%



## **LOG OF BORING B-28**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 11, 2016

Logged By:
Drilled By:
Drilling Method:

: M. Spino

: M. Hynes : HSA (Geoprobe 7822 DT)

Inland Bays Regional Wastewater Facilities Drilling Method:			: HSA (Geoprobe 7822 DT)					
ļ	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		<del></del>		
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks	
0-	Valleuriah harry wat van laga fina ta		ene	,	7	1		
2-	Yellowish brown, wet, very loose, fine to SAND, with some silt, trace clay (10 YR loam)	5/6, Sandy		SM	1	1-2-2-2	Scale 1" ~ 6.2 feet	
4-	Yellowish brown, wet, very loose, fine to SAND, with little silt, trace clay (10 YR 5	/4, Loamy sand)		SP-SM	2	5-3-2-3	No organic bearing soil was encountered at the ground surface.	
6-	Yellow, wet to satruated, very loose, fine SAND, with trace silt (10 YR 7/4, Sand)			SP	3	1-2-2-3	Groundwater was encountered at 6 feet during drilling operations.	
- 8-	Brownish yellow, saturated, loose, fine to SAND, with trace silt (10 YR 6/8, Sand)			SP	4	2-3-3-3	At completion water was at 6feet; boring caved in at 7.5 feet.	
10-	Yellow, saturated, very loose to loose, fi SAND, with trace silt (10 YR 7/8, Sand)	ne to coarse		SP	5	1-1-2-3	Laboratory Test Results	
12-				<u> </u>	6	2-3-4-4	Sample No. 3 From 4 to 6 feet	
14-	White, saturated, loose, fine to medium trace to little silt (10 YR 8/1, Loamy sand	d)		SP-SM	7	2-2-3-3	Sieve Analysis	
16-	Very pale brown, saturated, very loose t coarse SAND, with trace silt (10 YR 7/3,				8	1-4-3-4	Sieve Passing Size %	
18-				SP	9	1-1-2-3	3/8" 100 No. 4 99.7	
-					10	1-2-4-3	No. 10 97.3 No. 20 89.5 No. 40 56.1	
20-	Boring terminated at 20 feet.						No. 60 22.9 No. 100 11.4	
22-							No. 200 8.6	
24-							Natural Moisture = 16.8%	
26-								
28-					***************************************	<u> </u>		
30-								
32-								
34-								
36-								
38-								
40-								
42-		<del></del>	•					



## **LOG OF BORING B-29**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 10, 2016

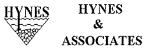
Logged By: Drilled By:

: J. Lindsey : M. Hynes

Inland Bays Regional Wastewater Facilities

Drilling Method:

	Project No.: JDH-10/16/279 Total Depth:		SA (Geopi D feet		,	
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0- - 2-	Brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 5/3, Sand)  Brown, wet, very loose, fine to medium SAND, with little		SP	1	1-1-1-1	Scale 1" ~ 6.2 feet  Approximately 2 inches of organic
4-	silt, trace clay (10 YR 5/3, Loamy sand)		SP-SM	2	1-1-1-2	bearing soil was encountered at the ground surface.
6	Very pale brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 7/3, Sand)		SP	3	2-2-2-3	Groundwater was encountered at 7 feet
_	Brownish yellow, saturated, very loose, fine to medium SAND, with trace silt (10 YR 6/6, Sand)		SP	4	1-1-2-2	during drilling operations.  At completion water was at 7.5feet;
8-	Light yellowish brown, saturated, very loose, fine to medium SAND, with trace silt (10 YR 6/4, Sand)			5	1-1-1-2	boring caved in at 8 feet.
10-				6	2-2-2-3	Laboratory Test Results Sample No. 4
12-			SP	7	1-2-2-3	From 6 to 8 feet
14-				8	1-1-2-2	Sieve Analysis
16-	Pale brown, saturated, loose, fine to coarse SAND, with			9	3-3-4-5	Sieve Passing Size %
18-	trace silt (10 YR 6/3, Sand)		SP	10	1-2-4-4	No. 4 100 No. 10 99.6 No. 20 98.3
20-	Boring terminated at 20 feet.					No. 40 91.8 No. 60 46.8
22-						No. 100 16.8 No. 200 10.6
24-						Natural Moisture = 23.3%
26-						
28-				······································		
30-						
32-						
34-						
36-						
38-						
40-						
4						
42-						-



## LOG OF BORING B-30

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 11, 2016

Logged By: Drilled By:

: M. Spino : M. Hynes

DESCRIPTION  DESCR	Inland Bays Regional Wastewater Facilities  Drilling Method:				: HSA (Geoprobe 7822 DT)					
Very pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  SP 8 3 3-2-2 during drilling operations.  Light yellowish brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/4, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/5, Sand)  SP 8 3-4-5-5 No. 20 7-8.3  No. 40 964  No. 40 964  No. 10 968  No. 60 97-8.3	***************************************	Project No.: JDH-10/16/279	Total Depth:	: 20	feet	*************************	-			
Yellowish brown, wet, very loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sandy loam)  Yellowish brown, saturated, sore, fine to medium SAND, with trace sit (10 YR 6/6, Sand)  Sand, with trace sit (10 YR 6/4, Sand)  Yery pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Yery pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Yery pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Yery pale brown, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Brownish yellow, saturated, loose, fine to coarse SAND, with trace sit (10 YR 6/6, Sand)  Sp	Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks		
SAND, with some silt, trace clay (10 YR 5/6, Sandy)  Brownish yellow, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/6, Sand)  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/6, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/6, Sand)  Pownish yellow, saturated, medium dense, fine to coarse SAND, with trace silt (10 YR 6/6, Sand)  Brownish yellow, saturated, medium dense, fine to coarse SAND, with trace silt (10 YR 6/6, Sand)  Boring terminated at 20 feet.  SAND, with trace silt (10 YR 6/6, Sand)  SP  Boring terminated at 20 feet.  SAND, with trace silt (10 YR 6/6, Sand)  SP  Boring terminated at 20 feet.  SAND, with trace silt (10 YR 6/6, Sand)  SP  Boring terminated at 20 feet.  SAND, with trace silt (10 YR 6/6, Sand)  SP  SP  SP  SP  SP  SP  SP  SP  SP  S	0-	Yellowish brown wet very loose fine to	COSICE	ele el		П				
Brownish yellow, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/6, Sand)  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  SP  SP  SP  SP  SP  SP  SP  SP  SP  S	_	SAND, with some silt, trace clay (10 YR	5/6, Sandy		CNA	1	1-2-2-2	Scale 1" ~ 6.2 feet		
Brownish yellow, well, very loose, fine to medium SP 3 3 2-2-2 Groundwater was encountered at 6 feet during drilling operations.  Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/8, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/8, Sand)  Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/8, Sand)  Brownish yellow, saturated, medium dense, fine to coarse SAND, with trace silt (10 YR 6/6, Sand)  SP 10 3-2-2-2 Groundwater was encountered at 6 feet during drilling operations.  At completion water was at 6 feet; boring caved in at 6.5 feet.  Laboratory Test Results  Sample No. 10 From 18 to 20 feet  Sieve Passing Size %  Sieve Passing Size %  No. 4 99.4 No. 1 99.4 No. 1 99.3 No. 4 99.4 No. 1	_	loam)			SIVI	2	2-1-1-2			
Light yellowish brown, saturated, very loose, fine to coarse SAND, with trace silt (10 YR 6/4, Sand)   SP	-	SAND, with trace silt (10 YR 6/6, Sand)			SP	3	3-2-2-2	1		
10	_	Light yellowish brown, saturated, very lo coarse SAND, with trace silt (10 YR 6/4,	ose, fine to , Sand)			4	1-2-2-3			
12	- 10-				SP	5	2-1-2-2	Laboratory Test Results		
Very pale brown, saturated, loose, fine to coarse   SAND, with trace sit (10 YR 8/3, Sand)   SP   B     3-4-5-5   Sieve   Passing   Size   %	- 12-					6	1-3-4-5			
Very pale brown, saturated, loose, fine to coarse   SP   8     3.4-5-5   Sieve   Passing   Size   %						7	2-3-3-4	Sieve Analysis		
Brownish yellow, saturated, medium dense, tine to coarse SAND, with trace silt (10 YR 6/6, Sand)  8	-	Very pale brown, saturated, loose, fine t SAND, with trace silt (10 YR 8/3, Sand)	o coarse		SP	8	3-4-5-5			
SP 10 3-4-5-5 No. 10 95.8 No. 20 78.3 No. 40 38.9 No. 60 16.3 No. 100 10.4 No. 200 7.7 Natural Moisture = 14.2%	10-	Brownish yellow, saturated, medium der	nse, fine to			9	4-6-5-6			
20 Boring terminated at 20 feet.  No. 40 38.9 No. 60 16.3 No. 100 10.4 No. 200 7.7  Natural Moisture = 14.2%  30 - 32 - 34 - 36 - 38 - 40 - 40 - 40 - 40 - 40 - 40 - 40 - 4	18-	obuloe of the, was trade on (10 170 oro,	Cunay		SP			No. 10 95.8		
22- 24- 26- 28- 30- 32- 34- 36- 38- 40-	20-					10	3-4-5-5	No. 40 38.9		
24- 26- 28- 30- 32- 34- 36- 38- 40-	22 –	Boring terminated at 20 feet.						No. 100 10.4		
28 30- 32- 34- 36- 38- 40-	24 <i>-</i>							Natural Moisture = 14.2%		
30- 32- 34- 36- 38- 40-	26-									
32 - 34 - 36 - 38 - 40	28 <i>-</i>									
34 — 36 — 38 — 40 —	30 <i>-</i> -									
36 — 38 — 40 —	32-									
38 — 40 —	34-									
	36									
-	38									
42—	40-									
	42-									



## **LOG OF BORING MW-12**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 10, 2016

Logged By:

: M. Spino

Baltimore, Maryland 21231 Drilled By:				: M. Hynes						
Inland	Bays Regional Wastewater Facilities	Drilling Method:		SA (Geoprobe 7822 DT)						
ļ <sub>.</sub>	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet	••••	T	<u></u>			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks			
0- - 2-	Light yellowish brown, wet, loose, fine to SAND, with little silt (10 YR 6/4, Loamy	medium sand)		SP-SM	1	2-4-4-3	Scale 1" ~ 6.2 feet			
4-	Strong brown, wet, very loose, fine to m with some silt, trace clay (10 YR 5/6, Sa	edium SAND, indy loam)		SM	2	3-1-1-2	No organic bearing soil was encountered at the ground surface.			
-	Yellowish brown, wet to saturated, loose medium SAND, with some silt, trace clay Sandy loam)	e, fine to y (10 YR 5/6,		SM	3	2-3-3-3	Groundwater was encountered at 6 feet during drilling operations.			
- 8-	Very pale brown, saturated, very loose to coarse SAND, with trace silt, trace fine g	to loose, fine to gravel (10 YR			4	1-2-2-3	Laboratory Test Results			
- 10-	7/3, Sand)				5	1-2-3-3	Sample No. 8 From 14 to 16 feet			
12-					6	1-2-3-5	Sieve Analysis Sieve Passing			
- 14-				SP	7	2-2-3-4	Size %			
16-					8	2-3-5-5	1" 100 3/4" 93.6 1/2" 91.2			
- 18-					9	2-3-5-5	3/8" 91.2 No. 4 90.6			
20-					10	2-3-3-5	No. 10 89.7 No. 20 83.2 No. 40 40.2			
-	Boring terminated at 20 feet.						No. 60 15.3 No. 100 11.2			
22-							No. 200 8.5  Natural Moisture = 16.5%			
24-										
26 <del>-</del>				L		<del> </del>				
28-										
30-										
32 <del>-</del>										
34-										
36 <del>-</del>	*									
38- -										
40-										
42-			···		<del></del>					



## **LOG OF BORING MW-13**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Logged By:

Date Completed:

: October 10, 2016

Drilled By:

: M. Spino : M. Hynes

Drilling Method:

man	Project No.: JDH-10/16/279 Total Depth:		oa (Geopi ) feet			
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0- 2-	Light yellowish brown, wet, very loose, fine to medium SAND, with little silt (10 YR 6/6, Loamy sand)		SP-SM	1 2	1-2-2-2 2-1-1-1	Scale 1" ~ 6.2 feet  No organic bearing soil was encountered at the ground surface.
4-	Brownish yellow, wet to saturated, very loose, fine to medium SAND, with trace silt (10 YR 6/6, Sand)		SP	3	1-1-1-2	Groundwater was encountered at 6 feet during drilling operations.
6-	Pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 6/3, Sand)		SP	4	2-2-3-4	Laboratory Test Results
8-	Very pale brown, saturated, loose, fine to medium SAND, with trace to little silt (10 YR 7/3, Sand)			5	1-2-3-3	Sample No. 6 From 10 to 12 feet
10-			SP	6	2-3-3-3	Sieve Analysis
12-				7	1-2-3-4	Sieve Passing Size %
16-	Reddish yellow, saturated, loose, fine to medium SAND, with some silt, trace clay (7.5 YR 6/8, Sandy loam)		SM	8	1-2-3-5	No. 4 100 No. 10 99.8 No. 20 97.2
18-	Very pale brown, saturated, loose, fine to medium SAND, with trace to little silt (10 YR 7/3, Loamy sand)		SP-SM	9	2-2-3-4	No. 40 67.0 No. 60 31.5
20-	Very pale brown, saturated, loose, fine to coarse SAND, with trace silt (10 YR 7/4, Sand)		SP	10	2-3-4-5	No. 100 15.5 No. 200 11.4
22-	Boring terminated at 20 feet.					Natural Moisture = 18.2%
24						
26-						
28-						
30-						
32-						
34-						
36-			٠			
38-						
40-						
42-						



### **LOG OF BORING MW-14**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 28, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

Drilling Method:

manc	Project No.: JDH-10/16/279	Total Depth:		SA (Geopr ) feet	ODE 702.	201)	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Yellowish brown, wet, very loose, fine to r SAND, with little silt (10 YR 5/4, Sandy lo			SM	1	1-1-1-1	Scale 1" ~ 6.2 feet
2-	Yellowish brown, wet, loose, fine to mediu with little silt, trace clay (10 YR 5/4, Sand			SM	2	3-4-3-3	Approximately 1 inch of organic bearing soil was encountered at the ground
4-	Yellow, wet, loose, fine to medium SAND silt, trace clay (10 YR 7/8, Sandy loam)	, with some		SM	3	4-5-5-5	surface.  Groundwater was encountered at 11
6- - 8-	Reddish yellow, loose, fine to medium SA silt (7.5 YR 6/6, Sandy loam)			SM	4	5-4-3-3	feet during drilling operations.  Laboratory Test Results
10	Yellow, wet, very loose, fine to medium Some silt (10 YR 7/6, Sandy loam)	AND, with		SM	5	2-1-1-1	Sample No. 9 From 16 to 18 feet
12-	Very pale brown, wet to saturated, very lo medium SAND, with some silt (10 YR 7/4	, Sandy Ioam)		SM	6	1-1-1-2	Sieve Analysis
14-	Very pale brown, saturated, loose, fine to SAND, with some silt, trace clay (10 YR 7 loam)			SM	7	2-2-3-3	Sieve Passing Size %
16-	,	***************************************			8	2-2-4-4	No. 4 100 No. 10 99.9
18-	Yellow-brown, saturated, medium dense, SAND, with trace to little silt (10 YR 5/6, L	oamy sand)		SP-SM	9	3-4-6-6	No. 20 94.8 No. 40 59.4
20-	Yellow-brown, saturated, loose, fine to me with trace to little silt (10 YR 5/6, Loamy s	edium SAND, and)		SP-SM	10	4-4-5-5	No. 60 28.7 No. 100 15.0 No. 200 10.0
22-	Boring terminated at 20 feet.						Natural Moisture = 25.8%
24							
26							
28-							
30-							
32-							
34 –							
36-							
38-							
40-							
42-							



### **LOG OF BORING MW-15**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Street Logged By:

Date Completed: Logged By: Drilled By: : September 15, 2016 : C. Johnston

: M. Hynes

	Baltimore, Maryland 21231	Drilled By: Drilling Method:		Hynes			,
Inland	d Bays Regional Wastewater Facilities			orobe 7822	2 DT)		
	Project No.: JDH-10/16/279	Total Depth:	: 20	feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0- - 2-	Light brownish gray, wet, very loose, fin SAND, with trace to little silt (10 YR 6/2,			SP	1	1-1-1-1	Scale 1" ~ 6.2 feet
4-	Grayish brown, wet, loose, fine to media some silt, trace clay (10 YR 5/2, Loamy	sand)		SM	2	4-4-4-5	Approximately 2 inches of organic bearing soil was encountered at the ground surface.
6	Very pale brown, wet, loose, fine to med with some silt (10 YR 7/3, Sand)	dium SAND,		SP	3	3-4-4-3	Groundwater was encountered at 9 feet during drilling operations.
- 8-	Light gray, wet to saturated, medium sti	ff silby CLAV			4	2-2-3-3	Laboratory Test Results
- 10	with little fine to medium sand (mottled) clay loam)	(10 YR 7/2, Silty		CL	5	2-2-3-3	Sample No. 9 From 16 to 18 feet
- 12	Light brownish gray, saturated, loose, fit SAND, with little to some silt (10 YR 6/2	, Sandy Ioam)	<u> </u>	SM	6	3-4-4-4	Sieve Analysis
14-	Very pale brown, saturated, loose, fine to SAND, with little to some silt (10 YR 7/3 Very pale brown, saturated, loose, fine to	, Sandy Ioam)		SM	7	1-2-3-4	Sieve Passing Size %
16	SAND, with trace silt (10 YR 7/3, Sand)  Very pale brown, saturated, loose, fine to			SP	8	5-5-4-4	3/8" 100 No. 4 99.3 No. 10 98.7
18	SAND, with trace silt (10 YR 8/3, Sand) Strong brown, saturated, medium dense			SP	9	4-4-4	No. 20 87.0 No. 40 44.5
20-	SAND, with trace silt (7.5 YR 5/6, Sand)	ĺ			10	2-5-8-8	No. 60 25.8 No. 100 15.7 No. 200 8.1
22-				SP			Natural Moisture = 19.4%
24 – -							
26 <del>-</del>	Boring terminated at 20 feet.		1/31/1/				
28- -							
30 <del>-</del>		***************************************			1,1	* * * * * * * * * * * * * * * * * * *	
32-							
34 <i>-</i> -	·						
36-							
38-							
40-							
42-							



## LOG OF BORING MW-16

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 15, 2016 : C. Johnston

Logged By: Drilled By:

: M. Hynes

Drilling Method:

- Tricing	Project No.: JDH-10/16/279	Total Depth:		isa (Geop 6 feet	1006 702	201)	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Light gray, wet, very loose, fine to mediu	ım SAND, with		SP	1	1-1-1	Scale 1" ~ 6.2 feet
2 -	Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)	ium SAND, with		SP	2	2-2-1-1	Approximately 1 inch of organic bearing soil was encountered at the ground
4-	Very pale brown, wet, very loose, fine to SAND, with trace silt (10 YR 7/3, Sand)	medium		SP	3	1-1-1-1	surface.  Groundwater was encountered at 17
6-	Yellowish brown, wet, medium dense, fir SAND, with little to some silt, trace clay (			SM	4	2-4-6-7	feet during drilling operations.  Laboratory Test Results
8- - 10-	Sandy loam)  Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/3, Sand)	ium SAND,	1	SP	5	3-4-4-3	Sample No. 6 From 10 to 12 feet
10	Light gray, wet, medium stiff, silty CLAY, to medium sand (10 YR 7/2, Silty clay lo	with trace fine am)		CL	6	2-2-4-5	Atterberg Limits
14-	Light brownish gray, wet, medium stiff, c with trace fine to medium sand (10 YR 6	/2, Silt loam)		ML	7	3-3-3-3	Liquid Limit = 46 Plasticity Index = 22
16-	Light brown, wet, stiff, clayey SILT, with medium sand (7.5 YR 6/4, Silt loam)			ML	8	2-4-7-8	Natural Moisture = 20.9%  Sample No. 6
18-	Light yellowish brown, wet to saturated, ifine to medium SAND, with little to some Sandy loam)			SM	9	4-6-6-7	From 10 to 12 feet Sieve Analysis
20					10	6-9-11-12	Sieve Passing
22-	Very pale brown, saturated, medium der medium SAND, with trace to little silt, (10, sand)			SP-SM	11	3-4-7-8	Size % No. 10 100
24-	Brownish yellow, saturated, loose, fine to SAND, with little to some silt (10 YR 6/6,			SM	12	2-3-3-3	No. 20 99.9 No. 40 99.4 No. 60 95.6
26-	Boring terminated at 26 feet.				13	2-2-3-3	No. 100 85.9 No. 200 51.1
28-	boing terminated at 20 feet.						Natural Moisture = 17.0%
30-							Sample No. 13 From 24 to 26 feet
32-							Sieve Analysis Sieve Passing
34-							Size %
36-							No. 4 100 No. 10 99.9 No. 20 99.3
38-							No. 40 89.4 No. 60 37.9 No. 100 13.3
40-							No. 200 8.2  Natural Moisture = 22.6%
42-			<u></u>				



## LOG OF BORING MW-17

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 28, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

Drilling Method:

DESCRIPTION  DESCR	man	Project No.: JDH-10/16/279	Total Depth:	u.	: 26 fe		De 7022 DT)	
Brownish yellow, wet, very loose, fine to medium SAND, with trace sit (10 YR 6/3, Sand)  Pale brown, wet, very loose, fine to medium SAND, with trace sit (10 YR 6/3, Sand)  Pale brown, wet, very loose, fine to medium SAND, with trace sit (10 YR 6/3, Sand)  Very pale brown, wet, loose, fine to medium SAND, with trace sit (10 YR 6/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with strace sit (10 YR 6/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with trace sit (10 YR 8/2, Sand)  Light gray, wet to saturated, medium stiff, silty CLAY, with trace fine to medium SAND, with trace sit (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with some sit (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with trace sit (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with trace sit (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with some sit (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with strace sit (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with strace sit (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with strace sit (10 YR 7/3, Sandy loam)  SM 11	Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
Pale brown, wet, very loose, fine to medium SAND, with trace sitt (10 YR 6/3, Sand)  Pale brown, wet, loose, fine to medium SAND, with trace sitt (10 YR 6/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with race sitt (10 YR 6/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with race sitt (10 YR 6/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with some sitt, trace clay (10 YR 8/2, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with some sitt, trace clay (10 YR 8/2, Sand)  Light gray, wet to saturated, medium stiff, silty CLAY, with trace fine to medium SAND, with some sitt (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with some sitt (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some sitt (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some sitt (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with incited (10 YR 7/1, Loamy sand)  Light gray, saturated, loose, fine to medium SAND, with incited (10 YR 7/1, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with incited (10 YR 7/1, Sandy loam)  SM  SM  11  SM  12  Aboratory Test Results  Sample No. 8  Form 14 to 16 feet  Atterberg Limits  Ludor Limits = 18  Atterberg Limits  Ludiud Limit = 38  Abatural Moisture = 19 4%  Sample No. 9  Form 16 to 18 feet  Sieve Analysis  Sieve Passing  Size %  Sample No. 13  No. 200 12.6  Sample No. 13  No. 20 97.9  No. 40 72.9  No. 60 99.9  No. 40 99.9  No.	0 <del>-</del>		medium		SP	1	1-1-1-1	Scale 1" ~ 6.2 feet
Pale brown, wet, loose, fine to medium SAND, with trace sitt (10 YR 6/3, Sand)	-	Pale brown, wet, very loose, fine to med	ium			2	6-3-2-2	Approximately 2 inches of organic bearing soil was encountered at the ground surface.
Pale brown, wet, loose, fine to medium   SAND, with trace sitt (10 YR 6/3, Sand)   SP   4   2-2-3-4   Laboratory Test Results   SAND, with trace sitt (10 YR 7/3, Sand)   SP   5   5-6-5-7   Sample No. 8   From 14 to 16 feet   Sample No. 9   From 15 to 16 feet   Sample No. 9   From 16 to 18 feet   Sample No. 10   10   No.	-				SP	3	6-3-3-2	· -
Very pale brown, wet, medium dense, fine to medium SAND, with some silt, trace clay (10 YR 7/3, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with some silt (10 YR 8/2, Sand)  Very pale brown, wet, medium dense, fine to medium SAND, with trace sit (10 YR 8/2, Sand)  Light gray, wet to saturated, medium sand (10 YR 7/1, SM)  Light gray, wet to saturated, loose, fine to medium SAND, with some silt (10 YR 7/3, Sandy)  Light gray, saturated, loose, fine to medium SAND, with some silt (10 YR 7/1, Loamy sand)  Light gray, saturated, loose, fine to medium SAND, with some silt (10 YR 7/1, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)  SM  11  SM  SM  SP-SM  9  4-5-55  Sample No. 8  From 14 to 16 feet  Atterberg Limits  Liquid Limit = 36  Natural Moisture = 19.4%  Sample No. 9  From 16 to 18 feet  Sieve Passing  Size %  No. 10 100  No. 20 95.7  No. 60 35.6  No. 100 19.1  No. 200 12.6  Natural Moisture = 18.6%  Sample No. 13  From 24 to 26 feet  Sieve Passing  Size %  No. 4 100  No. 10 99.9  No. 40 72.9  No. 60 79.9  No. 60 79.	-	Pale brown, wet, loose, fine to medium SAND, with trace silt (10 YR 6/3, Sand)			SP	4	2-2-3-4	Laboratory Test Results
Very pale brown, wet, medium dense, fine to medium SAND, with some sitt, trace clay (10 YR 8/2, Sand)   Very pale brown, wet, medium dense, fine to medium SAND, with trace sitt (10 YR 8/2, Sand)   Light gray, wet to saturated, medium sand (10 YR 7/1, Sm)   Silly clay loam)  Very pale brown, wet to saturated, loose, fine to medium sand (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium sand (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium sand (10 YR 7/1, Loamy sand)   Light gray, saturated, loose, fine to medium SAND, with trace to little sitt (10 YR 7/1, Loamy sand)   Very pale brown, saturated, loose, fine to medium SAND, with some sitt (10 YR 7/1, Loamy sand)   Very pale brown, saturated, loose, fine to medium SAND, with some sitt (10 YR 7/1, Sandy loam)  SM	-				SP	5	5-6-6-7	, ,
Very pale brown, wet, medium dense, fine to medium SAND, with trace silt (10 YR 8/2, Sand)  Light gray, wet to saturated, medium silt (10 YR 7/3, Sandy loam)  Very pale brown, wet to saturated, loose, fine to medium SAND, with some silt (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/3, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/1, Loamy sand)  Light gray, saturated, loose, fine to medium SAND, with little silt, mottled (10 YR 7/1, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)  Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)  SM  11  4-4-4-4  No. 10  No. 20  12  4-4-5-5  Natural Moisture = 19.4%  Sample No. 9  From 16 to 18 feet  Sieve Passing  Size %  No. 10  10  No. 20  95.7  No. 40  70.5  No. 60  36.6  No. 100  19.1  No. 200  12.6  Natural Moisture = 18.6%  Sample No. 9  From 16 to 18 feet  Sieve Passing  Size %  No. 40  No. 20  12.6  Natural Moisture = 18.6%  Sample No. 9  From 16 to 18 feet  Sieve Analysis  11  4-4-4-4  No. 10  No. 20  12.6  Natural Moisture = 19.4%  A-4-5-5  No. 40  No. 10  10  No. 20  12.6  Natural Moisture = 19.4%  Sample No. 9  From 16 to 18 feet  Sieve Passing  Size %  No. 40  No. 20  12.6  Natural Moisture = 19.4%	_	medium SAND, with some silt, trace clay	ne to / (10 YR		SM	6	6-9-10-10	Liquid Limit = 36
Light gray, wet to saturated, medium stiff, silty CLAY, with trace fine to medium sand (10 YR 7/1, SM)	-	Very pale brown, wet, medium dense, fir			SP	7	8-10-12-13	1 .
Very pale brown, wet to saturated, loose, fine to medium SAND, with some silt (10 YR 7/3, Sandy loam)   SM   SM   Size   Passing   Size   Si	-	Light gray, wet to saturated, medium stif CLAY, with trace fine to medium sand (1	f, silty		ļ	8	4-4-3-3	
Coam   Light gray, saturated, loose, fine to medium SAND, with trace to little silt (10 YR 7/1, Lamy sand)   SM   11   Light gray, saturated, loose, fine to medium SAND, with little silt, mottled (10 YR 7/1, Sandy loam)   SM   12   SM   No. 10	18-	Very pale brown, wet to saturated, loose			SP-SM	9	4-5-5-5	
With trace to little silt (10 YR 7/1, Loamy sand)   11   12   4.4.4.4   No. 10   100   No. 20   95.7   No. 40   70.5   No. 60   35.6   No. 100   19.1   No. 200   12.6   No. 200   12.6   No. 100   19.1   No. 200   19.1   No. 2	-	loam) Light gray, saturated, loose, fine to medi	um SAND,		SM	10	5-5-4-4	
Very pale brown, saturated, loose, fine to medium SAND, with some silt (10 YR 7/4, Sandy loam)   SP-SM   12   4-4-4   No. 60   35.6 No. 100   19.1 No. 200   12.6		Light gray, saturated, loose, fine to medi	um SAND,			11	4-4-4	No. 20 95.7
Brownish yellow, saturated, loose, fine to medium SAND, with trace to little silt (10 YR 6/6, Sand)  Boring terminated at 26 feet.  Serve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.9 No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1 Natural Moisture = 18.6%	-	Very pale brown, saturated, loose, fine to	o medium		SM	12	4-4-4	No. 60 35.6 No. 100 19.1
Boring terminated at 26 feet.  Sample No. 13 From 24 to 26 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.9 No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1  Natural Moisture = 24.0%	-	Brownish yellow, saturated, loose, fine to	medium		SP-SM	13	4-4-5-5	
Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.9 No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1  Natural Moisture = 24.0%	-	Boring terminated at 26 feet.						· ·
Sieve Passing Size %  No. 4 100 No. 10 99.9 No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1 Natural Moisture = 24.0%	4							
No. 4 100 No. 10 99.9 No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1 Natural Moisture = 24.0%								
No. 20 97.9 No. 40 72.9 No. 60 29.0 No. 100 13.3 No. 200 9.1 Natural Moisture = 24.0%	4							No. 4 100
38 – No. 100 13.3 No. 200 9.1 Natural Moisture = 24.0%	-			·				No. 20 97.9 No. 40 72.9
Natural Moisture = 24.0%	4							No. 100 13.3
	4							Natural Moisture = 24.0%
42-	+							



## **LOG OF BORING MW-18**

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Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 26, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Drilling Method:

	Project No.: JDH-10/16/279	Total Depth:	: 2:	2 feet		,	
Depth in Feet	DESCRIPTION		GRAPHIC	USCS	Sample No.	Blows per 6 inches	Remarks
190 0 - 2 - 4 - 6 - 8 - 10 - 12 - 14 - 16 - 18 - 20 - 22 - 24 - 26 - 30 - 32 - 34 - 36 - 38 - 40 - 40 - 10 - 10 - 10 - 10 - 10 - 10	Brown, wet, very loose, fine to medium Strace silt (10 YR 5/3, Sand)  Yellowish brown, wet, very loose, fine to SAND, with some silt, trace clay (10 YR loam)  Brownish yellow, wet, very loose, fine to SAND, with trace silt (10 YR 6/6, Sand)  Very pale brown, wet, loose, fine to med with some silt, trace clay (10 YR 7/4, Sand)  Very pale brown, wet, medium dense, fir SAND, with trace silt (10 YR 8/2, Sand)  Very pale brown, wet, loose, fine to med with little silt, trace clay (10 YR 8/2, Sand)  Light gray, wet, loose, fine to medium SA to little silt (10 YR 7/1, Loamy sand)  Very pale brown, wet to saturated, loose medium SAND, with little silt (10 YR 2/4, Brownish yellow, saturated, loose, fine to SAND, with trace silt (10 YR 6/6, Sand)  Very pale brown, saturated, loose, fine to SAND, with trace silt (10 YR 7/3, Sand)  Boring terminated at 22 feet.	medium 5/4, Sandy medium ium SAND, ndy loam) ne to medium ium SAND, dy loam) AND, with trace , fine to Sandy loam) o medium	GR	SP SM SP SM SP-SM SP-SM SP-SM SP-SM	1 2 3 4 5 6 7 8 9 10 11	1-1-1-2 4-2-2-2 3-2-2-2 3-3-4-4 2-5-7-7 4-3-3-3 1-2-3-3 2-3-3-4 2-2-3-3	Scale 1" ~ 6.2 feet  Approximately 2 inches of organic bearing soil was encountered at the ground surface.  Groundwater was encountered at 15 feet during drilling operations.  Laboratory Test Results  Sample No. 7 From 12 to 14 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.6 No. 20 98.9 No. 40 82.0 No. 60 27.3 No. 100 15.4 No. 200 10.9  Natural Moisture = 23.2%  Sample No. 9 From 16 to 18 feet  Sieve Analysis  Sieve Passing Size %  No. 4 100 No. 10 99.6 No. 20 97.9 No. 40 82.1 No. 60 35.0 No. 100 15.9 No. 200 10.7  Natural Moisture = 22.7%
42-							



## **LOG OF BORING MW-19**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 23, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

Drilling Method:

	Project No.: JDH-10/16/279	Total Depth:		3 feet .	robe 762.		
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0	Yellowish brown, wet, very loose, fine to SAND, with trace silt (10 YR 5/4, Sand)	medium		SP	1	1-2-2-2	Scale 1" ~ 6.2 feet
2-	Dark yellowish brown, wet, very loose, fi SAND, with trace silt (10 YR 4/4, Sand)	ne to medium		SP	2	8-2-2-3	Approximately 2 inches of organic bearing soil was encountered at the
4- 6-	Light yellowish brown, wet, very loose, fi SAND, with trace silt (10 YR 6/4, Sand)	ne to medium		SP	3	8-2-2-3	ground surface.  Groundwater was encountered at 15
6- - 8-	Light yellowish brown, wet, loose, fine to SAND, with trace silt (10 YR 6/4, Sand)	medium		SP	4	8-3-5-5	feet during drilling operations.  Laboratory Test Results
0- 10-	Light yellowish brown, wet, medium dens medium SAND, with trace silt (10 YR 6/4	1, Sand)		SP	5	14-8-7-7	Sample No. 8 From 14 to 16 feet
10 - 12-	Very pale brown, wet, medium dense, fir SAND, with some silt (10 YR 8/2, Sandy	loam)		SM	6	13-7-6-6	Sieve Analysis
14-	Yellow, wet, very loose, fine to medium strace silt (10 YR 7/6, Sand)			SP	7	3-3-3-2	Sieve Passing Size %
16-	Yellow, wet to saturated, loose, fine to co with trace silt (10 YR 7/6, Sand)			SP	8	1-3-3-3	No. 4 100 No. 10 99.9
18-	Very pale brown, saturated, loose, fine to SAND, with trace to little silt (10 YR 7/3,	Loamy sand)		SP-SM	9	2-3-3-4	No. 20 93.2 No. 40 64.1 No. 60 22.9
20-	Yellow, saturated, loose, fine to medium little to some silt (10 YR 7/6, Sand)			SP	10	3-3-4-5	No. 100 11.0 No. 200 7.9
22-	Very pale brown, saturated, loose, fine to SAND, with little silt (10 YR 7/4, Loamy s				11	3-4-4-5	Natural Moisture = 26.0%
24-				SP-SM	12	2-3-4-5	Sample No. 12 From 22 to 24 feet
26		***************************************			13	1-3-4-5	Sieve Analysis
28-	Boring terminated at 26 feet.						Sieve Passing Size %
30-							3/8" 100 No. 4 99.9
32-							No. 10 99.7 No. 20 97.0 No. 40 86.4
34-							No. 60 51.6 No. 100 18.9 No. 200 12.5
36-							Natural Moisture = 20.9%
38						· · · · · · · · · · · · · · · · · · ·	
40-							
42-							



## **LOG OF BORING MW-20**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: October 5, 2016

Logged By: Drilled By:

: M. Spino : M. Hynes

Inland Bays Regional Wastewater Facilities

Drilling Method:

	Project No.: JDH-10/16/279	Total Depth:	: 2	0 feet			
Depth in Feet	DESCRIPTION		GRAPHIC	USCS	Sample No.	Blows per 6 inches	Remarks
0-	Light yellowish brown, wet, very loose, fi SAND, with trace to little silt (10 YR 6/4,	ne to medium Loamy sand)		SP-SM	1	1-1-1-1	Scale 1" ~ 6.2 feet
2-	Pale brown, wet, very loose, fine to med trace silt (10 YR 6/3, Sand)	ium SAND, with		SP	2	2-2-2-2	Approximately 4 inches of organic bearing soil was encountered at the
4-	Very pale brown, wet, very loose, fine to SAND, with little silt, trace clay (10 YR 7.	/4, Loamy sand)		SP-SM	3	3-2-2-2	ground surface.  Groundwater was encountered at 9 feet
8-	White, wet, very loose, fine to medium S silt, trace clay (10 YR 8/1, Sandy loam)			SM	4	2-2-2-2	during drilling operations.  Laboratory Test Results
10-	Yellow, wet to saturated, very loose, fine SAND, with trace silt (10 YR 7/6, Sand)			SP	5	1-1-1-1	Sample No. 8 From 14 to 16 feet
12-	Yellow, saturated, very loose, fine to coa with trace to little silt (10 YR 7/6, Loamy	arse SAND, sand)		SP-SM	6	1-1-1-2	Sieve Analysis
14-	Light vallewish brown, acturated year to	and fine to			7	1-2-2-3	Sieve Passing Size %
16-	Light yellowish brown, saturated, very lo coarse SAND, with trace silt (10 YR 6/4, White, saturated, loose, fine to medium	Sand)		SP	8	1-1-2-2	1/2" 100 3/8" 97.6
18-	trace to little silt (10 YR 8/1, Loamy sand	i)		SP-SM	9	1-2-4-5	No. 4 87.5 No. 10 75.4 No. 20 60.1
20	Boring terminated at 20 feet.				10	1-2-4-4	No. 40 34.9 No. 60 17.1 No. 100 10.9
22-	<b>g</b>						No. 200 8.2
24							Natural Moisture = 13.2%
26-							
28-							
30-							
32-							
34-							
36-							
38-							
40- -							
42-					<u></u>		



### **LOG OF BORING MW-21**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 15, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inland Bays Regional Wastewater Facilities

Drilling Method:

mano	Bays Regional Wastewater Facilities Drilling Method: Project No.: JDH-10/16/279 Total Depth:		sa (Geop ) feet	robe 782	201)	
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Very pale brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 7/3, Sand)		SP	1	1-1-2-2	Scale 1" ~ 6.2 feet
2-	Yellowish brown, wet, loose, fine to medium SAND, with little to some silt, trace clay (10 YR 5/6, Sandy		SM	2	3-2-4-5	Approximately 3 inches of organic bearing soil was encountered at the
4- - 6-	loam) Brownish yellow, wet, loose, fine to medium SAND, with little silt, trace clay (10 YR 6/6, Sandy loam)	_	SM	3	5-4-4-4	ground surface.  Groundwater was encountered at 11
8-	Light gray, wet, very loose, fine to medium SAND, with trace silt (10 YR 7/2, Sand)		SP	4	1-2-2-3	feet during drilling operations.  Laboratory Test Results
10-			OI.	5	1-2-2-3	Sample No. 9 From 16 to 18 feet
10 - 12-	Light gray, wet to saturated, very loose, fine to medium SAND, with some silt (10 YR 7/1, Sandy loam)			6	1-1-2-2	Sieve Analysis
14			SM	7	1-WOH/18"	Sieve Passing Size %
16-				8	1-1-1-3	No. 4 100 No. 10 99.4
- 18	Light gray, saturated, medium dense, fine to coarse SAND, with trace silt (10 YR 7/2, Sand)		SP	9	4-5-5-7	No. 20 94.0 No. 40 67.8 No. 60 31.1
- 20-	Desire transitated at 00 feet			10	4-4-5-6	No. 100 15.1 No. 200 9.1
- 22-	Boring terminated at 20 feet.					Natural Moisture = 21.8%
24 <i>-</i>						
26 –						
28-					·	
30-						
32-						
34-						
36						
38-						
40-						
42-		·				



## **LOG OF BORING MW-22**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Inland Bays Regional Wastewater Facilities

Date Completed:

: September 23, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

ies Drilling Method:

iniano	Project No.: JDH-10/16/279	Drilling Method: Total Depth:		SA (Geopi ) feet	1006 702	201)	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0 2 4	Yellowish brown, wet, very loose, fine to SAND, with some silt (10 YR 5/6, Sandy Yellow, wet, very loose, fine to medium seems of the same	loam)		SM	1 2	1-1-1-1	Scale 1" ~ 6.2 feet  Approximately 3 inches of organic bearing soil was encountered at the ground surface.
6-	trace silt (10 YR 7/6, Sand)  Very pale brown, wet, very loose, fine to SAND, with trace silt (10 YR 8/3, Sand)			SP SP	4	3-2-2-2 4-2-2-2	Groundwater was encountered at 11 feet during drilling operations.
8- - 10-	Very pale brown, wet, very loose, fine to SAND, with little silt, mottled (10 YR 8/3,	Loamy sand)		SP-SM	5	5-2-2-2	Laboratory Test Results Sample No. 5 From 8 to 10 feet
- 12	Very pale brown, wet to saturated, very medium SAND, with little silt (10 YR 8/3,	Sandy loam)		SM	6	4-2-1-1	Sieve Analysis
14 16 18	Light gray, saturated, very loose, fine to with trace silt (10 YR 7/1, Sand)	medium SAND,		SP	7 8 9	1-2-2-1 2-2-2-2 2-2-2-4 3-3-3-3	Sieve Passing Size %  No. 4 100 No. 10 99.4 No. 20 93.4 No. 40 71.5 No. 60 43.7 No. 100 27.2 No. 200 14.4
20 — 22 — 24 — 26 — 30 — 32 — 34 — 36 — 38 — 38 — 38 — 38 — 38 — 38 — 38	Boring terminated at 20 feet.						Natural Moisture = 15.6%  Sample No. 7 From 12 to 14 feet  Sieve Analysis  Sieve Passing Size %  1/2" 100 3/8" 99.2 No. 4 99.0 No. 10 98.9 No. 20 93.0 No. 40 50.6 No. 60 21.9 No. 100 13.0 No. 200 9.1  Natural Moisture = 21.0%
40- 42-							



## LOG OF BORING MW-23

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 16, 2016

Logged By: Drilled By:

: C. Johnston : M. Hynes

Inland	Inland Bays Regional Wastewater Facilities Drilling Method:			SA (Geop	obe 782	2 DT)	
	Project No.: JDH-10/16/279	Total Depth:	: 20	) feet		T - · · · · · · · · · · · · · · · · · ·	
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Very pale brown, wet, very loose, fine to	medium	Y S	SP	1	1-1-2-2	Scale 1" ~ 6.2 feet
2-	SAND, with trace silt (10 YR 7/3, Sand)  Brownish yellow, wet, very loose, fine to	medium				1-1-2-2	Approximately 2 inches of organic
- 4-	SAND, with trace silt (10 YR 6/6, Sand)			SP	2	2-2-3-3	bearing soil was encountered at the ground surface.
6-	Brownish yellow, wet, loose, fine to med with trace silt (10 YR 6/6, Sand)			SP	3	6-3-3-5	Groundwater was encountered at 11 feet during drilling operations.
- 8-	Light gray, wet, loose, fine to medium Sasilt (10 YR 7/1, Sand)			SP	4	2-4-3-6	Laboratory Test Results
- 10	Gray, wet, medium dense, fine to mediu little silt, trace clay (10 YR 6/1, Sandy lo	am)		SM	5	4-3-6-7	Sample No. 7 From 12 to 14 feet
10 - 12-	Light gray, wet to saturated, medium de coarse SAND, with trace silt (10 YR 7/1,			SP	6	3-7-7-9	Sieve Analysis
	Very pale brown, saturated, very loose, SAND, with trace to little silt (10 YR 7/3,			SP-SM	7	7-5-2-3	Sieve Passing Size %
14	Light gray, saturated, very loose, fine to with trace to little silt (10 YR 7/2, Loamy			SP-SM	8	2-2-2-3	3/8" 100
16- -	Light gray, saturated, medium dense, fir SAND, with trace silt (10 YR 7/2, Loamy			SP-SM	9	4-5-5-6	No. 4 99.8 No. 10 98.1 No. 20 88.6
18-	Light gray, saturated, loose, fine to coar trace silt (10 YR 7/2, Sand)	se SAND, with		SP	10	3-3-5-5	No. 40 55.6 No. 60 28.1
20-	Boring terminated at 20 feet.				LJ		No. 100 16.3 No. 200 10.2
22-							Natural Moisture = 21.2%
24-							
26-							
28-							
30-							
32-							
34-							
36-							
38-							
40							
42 <i>-</i> -							



## **LOG OF BORING MW-24**

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 15, 2016

Logged By:

: C. Johnston : M. Hynes

Drilled By:

Inlan	Inland Bays Regional Wastewater Facilities Drilling Method:				orobe 782:	2 DT)	
	Project No.: JDH-10/16/279	Total Depth:	: 20	feet		*****	
Depth in Feet	DESCRIPTION	·	GRAPHIC	USCS	Sample No.	Blows per 6 inches	Remarks
0-	Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/4, Sand)	lium SAND,		SP	1	1-2-3-4	Scale 1" ~ 6.2 feet
2-	Brownish yellow, wet, very loose, fine to SAND, with little to some silt (10 YR 6/6	, Sandy loam)		SM	2	2-2-2-2	Approximately 3 inches of organic bearing soil was encountered at the ground surface.
6-	Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/4, Sand)			SP	3	5-4-3-5	Groundwater was encountered at 13
8-	Light yellowish brown, wet, medium den medium SAND, with trace silt (10 YR 6/4	4, Sand)		SP	4	6-7-7-9	feet during drilling operations.  Laboratory Test Results
10-	Light gray, wet, medium dense, fine to n with little silt (10 YR 7/2, Sandy loam)  Very pale brown, wet, medium dense, fine to new the second			SM	5	13-7-8-8	Sample No. 9 From 16 to 18 feet
12-	SAND, with trace silt (10 YR 7/3, Sand)  Brownish yellow, wet to saturated, soft, a			SP	6	19-8-9-10	Sieve Analysis
14-	with little fine to medium sand (mottled) loam)	(10 YR 6/6, Silt		ML	7	13-6-2-2	Sieve Passing Size %
16-	Light gray, saturated, loose, fine to med some silt, trace clay (10 YR 4/3, Sandy	oam)		SM	8	4-3-2-6	1/2" 100 3/8" 96.3
18-	Light gray, saturated, medium dense, fir SAND, with trace silt (10 YR 7/2, Sand)	ie to medium		SP	9	6-8-8-10	No. 4 90.2 No. 10 88.2 No. 20 83.2
20-	Boring terminated at 20 feet.			· · · · · · · · · · · · · · · · · · ·	10	4-1-1-3	No. 40 63.3 No. 60 28.9 No. 100 11.1
22-	, and the second						No. 200 5.7
24-							Natural Moisture = 20.1%
26-							
28-							
30-							
32-							
34-							
36-							
38-							
40-							
42-							



## LOG OF BORING MW-25

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Date Completed:

: September 16, 2016

Logged By:

: C. Johnston

Baltimore, Maryland 21231 Drilled By:				: M. Hyn	nes		
Inland	Inland Bays Regional Wastewater Facilities Drilling Method:			-	-	7822 DT)	
	Project No.: JDH-10/16/279	Total Depth:	<del>,</del>	: 20 feet			
Depth in Feet	DESCRIPTION		GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Pale brown, wet, loose, fine to medium Strace silt (10 YR 6/3, Sand)	SAND, with			1	3-4-4-5	Scale 1" ~ 6.2 feet
2-				SP	2	7-6-4-4	Approximately 3 inches of organic bearing soil was encountered at the ground surface.
4- 6-				,	3	12-3-3-4	Groundwater was encountered at 11 feet during drilling operations.
8-	Very pale brown, wet, loose, fine to med with trace silt (10 YR 7/3, Sand)			SP	4	12-4-4-4	Laboratory Test Results
10-	Very pale brown, wet, very loose, fine to SAND, with trace to little silt (10 YR 8/2, sand)	medium Loamy		SP-SM	5	10-2-2-2	Sample No. 5, From 8 to 10 feet Sieve Analysis
- 12	Very pale brown, wet to saturated, very to medium SAND, with little silt, trace cla			SM	6	6-10-1-3	Sieve Passing Size %
- 14-	\(\rightarrow\)8/2, Sandy loam)  Very pale brown, saturated, loose, fine to SAND, with little silt, trace clay (10 YR 8).			SM	7	1-2-3-4	No. 10 100 No. 20 99.3 No. 40 90.3
16-	loam) Very pale brown, saturated, loose, fine to			SP	8	3-3-4-5	No. 60 62.4 No. 100 23.7 No. 200 14.4
18-	SAND, with trace silt (10 YR 8/2, Sand) Light gray, saturated, medium dense, fin	e to coarse			9	6-7-6-7	Natural Moisture = 16.6%
20-	SAND, with trace silt, trace gravel (10 Yi Sand)	२ 7/1, 		SP	10	6-5-7-7	Sample No. 7, From 12 to 14 feet Sieve Analysis
22-	Boring terminated at 20 feet.						Sieve Passing Size %
24 – 26 –							No. 4 100 No. 10 99.7 No. 20 95.9 No. 40 81.1 No. 60 62.2
28-							No. 100 35.5 No. 200 21.6 Natural Moisture = 20.1%
30-							Sample No. 9, From 16 to 18 feet
32-							Sieve Analysis Sieve Passing Size %
34 – 36 –							No. 4 100 No. 10 98.6 No. 20 92.5 No. 40 62.3
38-							No. 60 22.0 No. 100 12.8 No. 200 9.5
40-							Natural Moisture = 24.5%
42-	•	***************************************					



## LOG OF BORING MW-26

(Page 1 of 1)

Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Baltimore, Maryland 21231
Inland Bays Regional Wastewater Facilities

Date Completed:

: September 15, 2016

Logged By: Drilled By: : C. Johnston : M. Hynes

Drilling Method:

	Project No.: JDH-10/16/279 Total Depth:		6 feet			
Depth in Feet	DESCRIPTION	GRAPHIC	nscs	Sample No.	Blows per 6 inches	Remarks
0-	Light yellowish brown, wet, very loose, fine to medium SAND, with trace silt (10 YR 6/4, Sand)		SP	1	1-1-2-2	Scale 1" ~ 6.2 feet
2 - 4	Light yellowish brown, wet, loose, fine to medium SAND, with trace silt (10 YR 6/4, Sand)		SP	2	9-4-4-4	Approximately 2 inches of organic bearing soil was encountered at the ground surface.
6-			J.	3	5-4-4-4	Groundwater was encountered at 15
8-	Brownish yellow, wet, loose, fine to medium SAND, with trace to little silt (10 YR 6/6, Loamy sand)		SP-SM	4	7-3-3-3	feet during drilling operations.  Laboratory Test Results
10-	Light gray, wet, loose, fine to medium SAND, with trace silt (10 YR 7/2, Sand)		SP	5	2-3-4-6	Sample No. 4 From 6 to 8 feet
12-			Į Oi	6	5-3-4-6	Sieve Analysis
14—	Light gray, wet, medium dense, fine to medium SAND, with trace silt (10 YR 7/1, Sand)		SP	7	5-5-6-6	Sieve Passing Size %
16-	Light gray, wet to saturated, loose, fine to medium SAND, with trace silt (10 YR 7/1, Sand)		SP	8	4-3-4-5	No. 4 100 No. 10 99.4
18-	Light gray, saturated, loose, fine to medium SAND, with some silt, trace clay (10 YR 7/2, Sandy loam)		ѕм	9	1-2-3-7	No. 20 95.9 No. 40 82.2
20-	Very pale brown, saturated, medium dense, fine to coarse SAND, with trace silt (10 YR 7/3, Sand)			10	6-8-9-11	No. 60 55.5 No. 100 31.8 No. 200 17.1
22-			SP	11	4-7-9-11	Natural Moisture = 4.0%
- 24				12	9-10-10-12	Sample No. 13 From 24 to 26 feet
_	Very pale brown, saturated, loose, fine to medium SAND, with little silt (10 YR 7/3, Loamy sand)		SP-SM	13	6-5-4-4	Sieve Analysis
26-	Boring terminated at 26 feet.					Sieve Passing Size %
28-						1/2" 100 3/8" 98.6
30-						No. 4 97.4 No. 10 95.4 No. 20 76.9
32-						No. 40 47.2 No. 60 29.1
34-						No. 100 16.4 No. 200 11.9
36-						Natural Moisture = 20.0%
38						
40-						
42-			***************************************			

WATER SUPPLY SECTION **DIVISION OF WATER RESOURCES** 89 KINGS HIGHWAY DOVER, DELAWARE 19901

#### STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

## WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	<b> </b>
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD
Permit #: 256134 Local ID: MW -17  Tax Map/Parcel #: 234-21.00-151.00  Property Owner: Sussex County, Delaware  Water Well Contractor: Hynes   Associates   WC Lic #: 919  Well Driller In Charge During Construction: Michael Hynes	Auger Bored Mud Rotary Driver Detted Dair Rotary Cable Tool Dwashed Dreverse Rotary Cother (Specify): Total Depth Of Excavation (Feet BGS):  Construction Date: 10/10/2016
Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  CASING INSTALLATION: INNER (I) (2) (2) (C) (C) (ACS=Above Ground Surface BGS=Below	SCREEN INSTALLATION:  Screen Top (Feet BGS): Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material: Screen Material: Screen Slot Size (1000 of an Inch):
WELL USE:  Domestic Industrial Heat Pump Supply Irrigation Public Heat Pump Recharge Agricultural Misc. Public Closed Loop Heat Pump Agricultural/Lawn Irrigation Montor Well Other (Specify)	TYPE OF PERMANENT PUMP INSTALLED:  Pump Manufacturer: Horsepower:  Rated Capacity: (GPM) Pump Intake Setting(ft. BGS):  Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump
#14	Pump Installed By:
Gravel Pack: From:	Site Plan - If different from original application, <u>must</u> note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).
WELL HEAD COMPLETION:  Type: Pad Mount  Well Pit Pad Mount  Other - Specify: Shek - Up A how Grade  Well Head Completed: 18 Inches Above Below Ground Surface	
Was The Well Tag Attached In Accordance With Current Regulations?  YES DO If "NO", Please Explain:  MW # 12	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Machine July Signature - Well Drille in Charge of Well Construction 4026  Well Driller License # Date

FAX: 302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED				
PERMIT #: 256134 LOCAL ID#: MW - 12				
PROPERTY OWNER: Sussex Country, DE				
WELL CONTRACTOR: Hyurs 3 Associates	WC LIC #: 919			
DESCRIPTION TOP OF STRA	ATA BOTTOM OF STRATA			
Yellowish brown fine to motion sand	. 6			
1941, to some silf trace clay				
Ven pale bour, Fine to coerse sail 6	20			
trace silt				
	-			
COMMENTS:				
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT				
Mulina Graph 4026 Signature of Well Briller in Charge of Construction  WD License #	71/27/16 Date			

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT

MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

#### WELL COMPLETION REPORT

PHONE: 302-739-9944

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

**DIVISION OF WATER RESOURCES** 

-Authorization Number-FAX: 302-739-7764 ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY DRILLING / EXCAVATION METHOD Auger □Bored ☐Mud Rotary Tax Map/Parcel #: 234-2 Driver □Jetted □Air Rotary □Cable Tool □Washed □Reverse Rotary ☐Other (Specify): Water Well Contractor: TVNIS \$ Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Michael Hyne: Construction Date: CASING INSTALLATION: INNER OUTER SCREEN INSTALLATION: (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch): WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply Pump Manufacturer: ☐ Irrigation □ Public ☐ Heat Pump Recharge ☐ Ágricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Rated Capacity: \_\_\_\_\_ (GPM) Pump Intake Setting(ft. BGS):\_\_\_ ☐ Agricultural/Lawn Irrigation Monitor X Other (Specify) Pump Type: 

Submersible 

Jet ☐ Vertical Turbine Pump Pump Installed By: ☐ Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Grout Type: 

Bentonite Clay 

Cement Bentonite Clay Plug distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available). From: Type Of Non-Grout Backfill Of Well Annulus: 5001011 From: O Feet To: 6 Feet Static Water Level: Feet Below ☐ Above Ground Surface Pumping Water Level: \_\_\_\_\_Feet On (Date): After: \_\_\_\_\_ Hours Pumping Rate: \_\_\_\_ GPM Pumping Method /Device: Airlift Mechanical (Pump) Other:\_\_\_\_\_ Was A Geophysical Log Taken? Yes No If "Yes", By:\_\_\_\_\_ WELL HEAD COMPLETION: Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit ☐ Pad Mount Acother-Specify: Stilk-Up Ahove Grade Well Head Completed: 18 Inches ★Above □ Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT. If "NO", Please Explain: Signature - Well Deiller in Charge of Well Construction Well Driller License # Date

FAX: 302-739-7764

STATE OF DELAWARE **DEPARTMENT OF NATURAL RESOURCES** AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED			
PERMIT #: 256 135 LOCAL ID#: MW - 13			
PROPERTY OWNER: SUSSIX (omly, DE			
WELL CONTRACTOR: Hymrs 3 Associates	w	CLIC#: 919	
DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA	
Yellowish brown, Fin to metium	0	6	
sand, trace to 15HIC silt			
Pale born, Fine to coop sand,	6	14	
trace silt			
Reddish yellow, fine to medium sad,	14	16	
some sit, trace clay			
Vey pale from the to coarse said	16	20	
trace silt			
,			
COMMENTS:			
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCUR.	ATE AND CORRECT	11/29/160	
	D License #	Date	

\*" MAIL'TO:

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

#### STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A

http://www.dnrec.state.de.us/

#### WELL COMPLETION REPORT

PHONE: 302-739-9944

WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

PHONE: 302-739-9944 FAX: 302-739-7764	-Authorization Number-
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	# DRILLING / EXCAVATION METHOD
Permit #: 255715 Local ID: MW-14	Auger □Bored □Mud Rotary □Driver □Jetted □Air Rotary
Tax Map/Parcel #: 234-22.00-10.00 Property Owner: Sussex County Delaware	□Cable Tool □Washed □Reverse Rotary
Water Well Contractor: 1115 \$ Associates WC Lic,#: 919	Cother (Specify):
Well Driller In Charge During Construction: Michael #1715	Total Depth Of Excavation (Feet BGS): 20 Construction Date: 9/28/2016
	Construction Date: 472872016
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:
Casing Top (Inches AGS): 36 (1) (2) (	Screen Top (Feet BGS):
Casing Bottom (Feet BGS):	Screen Bottom (Feet BGS): 20
Casing Diameter (Inches): 2 Sch 40 PVC	Screen Diameter (Inches):
Casing Material: Sch 40 WC Gravel Pack Size (#): AGS=Above Ground Surface BGS=Belov	Screen Material: Sch. 40 WC w Ground Surface Screen Slot Size (1000 of an Inch):
WELL USE:	TYPE OF PERMANENT PUMP INSTALLED:
□ Domestic □ Industrial □ Heat Pump Supply	
☐ Irrigation ☐ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump	Pump Manufacturer: Horsepower:
Agricultural/Lawn Irrigation Monitor Well	Rated Capacity:(GPM) Pump Intake Setting(ft. BGS):
Other (Specify) IVONID! WE!	Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
#14	Pump Installed By:   Others Date:
Gravel Pack: From: 8 Feet To: 20 Feet	Site Plan - If different from original application, <u>must</u> note changes such as
Grout Type: Bentonite Clay Cement Bentonite Clay Plug	distances from well to house, property lines, nearest road, and all nearby septic
Other: From: 6 Feet To: 8 Feet	systems and central sewer lines (included suitable plot plan if available).
Type Of Non-Grout Backfill Of Well Annulus: Bentonite Grout	
From: Feet To: Feet	
Static Water Level:FeetFBelow	
Pumping Water Level:Feet On (Date):	
After:Hours Pumping Rate:GPM  Pumping Method /Device:  Airlift  Mechanical (Pump) Other:	
Was A Geophysical Log Taken?  Yes No If "Yes", By:	
WELL HEAD COMPLETION:	
Type:  Pitless Adapter	
☐ Well Pit ☐ Pad Mount	
Other - Specify: Still-Up Alow (700)	
Well Head Completed: \ Inches \ XAbove □ Below Ground Surface	
Was The Well Tag Attached In Accordance With Current Regulations?	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND COBRECT,
YES □ NO If "NO", Please Explain:	911 1 0 (19 Donalls
MW #14	Signature - Well Driller in Charge of Well Construction
	4026
	Well Driller License # Date
	<b>,</b>

FAX:302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE – ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETUR	NED			
PERMIT #: 255715 LOCAL ID#: MW-14				
WELL CONTRACTOR: Hynrs 3 Associates	w	WC LIC#: 919		
DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA		
Light Yellowish Bown fin to medium		12		
sand, little to some silt				
Very pale from, fin to medium				
San, trace to little silt	12	20		
·				
COMMENTS:				
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT  MANUEL 1 129 110				
	WD License #	Date		

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

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WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

11Mi. 302 137-1104	
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	#
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD
Permit #: 255716 Local ID: MW - 15  Tax Map/Parcel #: 234-22,00 - 10,00  Property Owner: Sussex County, Delaway	☐ Bored ☐ Mud Rotary ☐ Driver ☐ Jetted ☐ Air Rotary ☐ Cable Tool ☐ Washed ☐ Reverse Rotary ☐ Other (Specify):
Water Well Contractor: Hynes & Assoc. WC Lic #: 919 Well Driller In Charge During Construction: Michael Hynes	Total Depth Of Excavation (Feet BGS): 20 Construction Date: 9/15/2016
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:
Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  AGS=Above Ground Surface BGS=Below	Screen Top (Feet BGS): Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material: Screen Slot Size (1000 of an Inch):
WELL USE:	TUDE OF DUBALANDAY DUAD INCTALLED
□ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation → HOR WEIL	Pump Manufacturer: Horsepower: Horsepower: Rated Capacity: (GPM) Pump Intake Setting(ft. BGS): Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump Pump Installed By: □ Others Date:
Gravel Pack: From: Seet To: Seet To: Seet Grout Type: Bentonite Clay Cement Sentonite Clay Plug  Other: From: Feet To: Feet Static Water Level: Feet Selow Above Ground Surface Pumping Water Level: Feet On (Date):  After: Hours Pumping Rate: GPM Pumping Method /Device: Airlift Mechanical (Pump) Other: Was A Geophysical Log Taken? Yes No If "Yes", By:  WELL HEAD COMPLETION:  Type: Pitless Adapter Standard "T"  Well Pit Pad Mount  Other - Specify: Sick Op Aport Ground Surface  Well Head Completed: Inches AAbove Below Ground Surface	Site Plan - If different from original application, <u>must</u> note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).
Was The Well Tag Attached In Accordance With Current Regulations?	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller Charge of Well Construction  HO26  Well Driller License #  Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY

DOVER, DELAWARE 19901 PHONE: 302-739-9944 FAX: 302-739-7764

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL E	E RETURNED	·		
	LOCAL ID#:	MW-15		
PROPERTY OWNER: Sussex County De lawage				
WELL CONTRACTOR: John D Hynes & A	ssociates	v	/C LIC #: 919	
DESCRIPTION		TOP OF STRATA	BOTTOM OF STRATA	
Light Brownish Gray, Fine to Mediu	m Sord	0	8	
Irate Silt				
Light Gray, Silty Clay with	1 Trace	8	10	
Fine to Medium Sand				
Light Pake Brown, Fine to Medic	im Sand	10	20	
with Trace to little Silt				
MW#15				
COMMENTS:				
		***************************************		
THEREBY AFFIRM THE INFORMATION I HAVE SUBMITT		TE AND CORRECT	10/14/16	
Signature of Well Driller in Charge of Construction		D License #	Date /	

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

**DIVISION OF WATER RESOURCES** 

INCLUDED WITH THIS REPORT.

-Authorization Number-

U I ECIDI E OD INCOMDI ETTE EODMC WALL DE DETAUNDE	
ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	# DRILLING / EXCAVATION METHOD
255717 11.	
Permit #:	□Auger □Bored □Mud Rotary □Driver □Jetted □Air Rotary
	□Cable Tool □Washed □Reverse Rotary
Property Owner: Sussex County, Delaware Water Well Contractor: Hunes & Assoc, WC Lic #: 919	Other (Specify):
Well Driller In Charge During Construction: MICHAEL HYDES	Total Depth Of Excavation (Feet BGS):
well Driller in Charge During donstruction: 111111 IICI IICI 11111	Construction Date:
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:
Casing Top (Inches AGS): (1) (2) (	3)
Casing Bottom (Feet BGS):	Screen Top (Feet BGS): (6) Screen Bottom (Feet BGS): 2/0
Casing Diameter (Inches):	Screen Bottom (Feet BGS): 210  Screen Diameter (Inches): 2
Casing Material: 2 Sch4D PVC	Screen Material: Sch 40 PVC
Gravel Pack Size (#): AGS=Above Ground Surface BGS=Belov	w Ground Surface Screen Slot Size (1000 of an Inch): O.OIO"
WELL USE:	Γ
	TYPE OF PERMANENT PUMP INSTALLED:
☐ Domestic ☐ Industrial ☐ Heat Pump Supply ☐ Irrigation ☐ Public ☐ Heat Pump Recharge	Pump Manufacturer: Horsepower:
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump	
Agricultural/Lawn Irrigation ACOTHER (Specify) MONTORING Well	Rated Capacity:(GPM) Pump Intake Setting(ft. BGS):
MIN # 11	Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
11100116	Pump Installed By:   ☐ Others Date:
Gravel Pack: From: 4 Feet To: 26 Feet	Site Plan - If different from original application, must note changes such as
Grout Type:   Bentonite Clay Cement Bentonite Clay Plug	distances from well to house, property lines, nearest road, and all nearby septic
Other: From: 12 Feet To: 14 Feet	systems and central sewer lines (included suitable plot plan if available).
Type Of Non-Grout Backfill Of Well Annulus: Rentonite Grat	;
From: Feet To: Feet	
Static Water Level:Feet  Below	
Pumping Water Level:Feet On (Date):	
After:Hours Pumping Rate:GPM	
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:	
Was A Geophysical Log Taken? 🗆 Yes 💢 No If "Yes", By:	
WELL HEAD COMPLETION:	
Type: ☐ Pitless Adapter ☐ Standard "T"	
□ Well Pit □ Pad Mount	
Dother-Specify: ) + (K-Up About Grove	
Well Pit  A Pad Mount  A Completed:  Inches Above Below Ground Surface	
Was The Well Tag Attached In Accordance With Current Regulations?	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
YES NO If "NO", Please Explain:	ACCURATE AND CORRECT.
mu) #110	Mulud Jagren
11100	Signature - Well Drifler in Charge of Well Construction
	Well Driller License #
	Well Driller License # Date

FAX: 302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WIL	L BE RETURNED		
PERMIT #: 255717	LOCAL ID#:	MW-16	•
PROPERTY OWNER: Sussex County [	75		
WELL CONTRACTOR: AND MASSON MASSES			WCLIC#: 9/9
DESCRIPTION		TOP OF STRATA	BOTTOM OF STRATA
Light Pale Brown, Fine to Medium	Sand	O	10
with Trace to Little Silt			
Light Gray, Silty Clay with Iroa	Fine to Mediua	10	16
Sand Light Brown, Fine to Medium Sand	with TraceSill	+ 16	20
MW#U			
	····		
		****	
COMMENTS:			
			1
	***************************************	***************************************	
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMIT		TE AND CORREC 4026	11/24/16
Signature of Well Briller in Charge of Construction	WE	License #	Date

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY DRILLING / EXCAVATION METHOD Auger □Bored □Mud Rotary Local ID: MW-17 Driver □Jetted □Air Rotary Tax Map/Parcel #: 234-22.00-10.00 □Cable Tool □Washed □Reverse Rotary □Other (Specify): Water Well Contractor: HVNLS ASSOCIOUS WC Lic.#: 9 Total Depth Of Excavation (Feet BGS): Well Driller in Charge During Construction: Michael Hunes Construction Date: CASING INSTALLATION: INNER OUTER SCREEN INSTALLATION: (1) (2) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch): WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply Pump Manufacturer: \_\_\_\_ ☐ Irrigation □ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Rated Capacity: (GPM) Pump Intake Setting(ft. BGS): Agricultural/Lawn Irrigation Other (Specify) Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: ☐ Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Grout Type: Bentonite Clay Cement Bentonite Clay Plug
Other: From: 12 Feet To: 14 distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available). Type Of Non-Grout Backfill Of Well Annulus: Bertonite Gro From: 6 Feet To: 12 Feet Static Water Level: 16 Feet Below Pumping Water Level: \_\_\_\_\_Feet On (Date):\_\_\_\_\_ After: \_\_\_\_\_Hours Pumping Rate: \_\_\_\_\_ GPM Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:\_\_\_\_\_ Was A Geophysical Log Taken? ☐ Yes X No If "Yes", By:\_\_\_\_\_ WELL HEAD COMPLETION: Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit ☐ Pad Mount Mother - Specify: Stick - Up About G Well Head Completed: Inches ★Above □ Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRE If "NO", Please Explain: Signature - Well Drifter in Charge of Well Construction Date

FAX:302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

# STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE – ILLEGIBLE OR INCOMPLETE FORMS WILL BE RET	URNE	D		
PERMIT #: 2 55 718   LOCAL ID#: MW-17				
PROPERTY OWNER: SUSSIX Comby D.E				
WELL CONTRACTOR: Hynes 3 Associates		, v	vc lic#: 919	
DESCRIPTION		TOP OF STRATA	BOTTOM OF STRATA	
Brownish yellow, fine to million		0	14	
sand trace to some silt				
Light gray, silty day trace				
Fine to metion sent		14	15	
Light gray, fin to medium sav	V			
trace to some silt	1	15	26	
COMMENTS:	k			
COMMENTS:				
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCOMMENCED IN THE INFORMATION I HAVE SUBMITTED IN THE INFORMATION I HAVE SUBMITTED IS ACCOMMENCED IN THE INFORMATION I HAVE SUBMITTED IN THE INFORMATION I HAVE SUBMITTED IS ACCOMMENCED IN THE INFORMATION I HAVE SUBMITTED INFORMATION I HAVE SUBMITTED IN THE INFORMATION I HAVE SUBMITTED INFORMATION I HAVE SUBMITTED INFORMATION INFORMATION I HAVE SUBMITTED INFORMATION I HAVE SUBMITTED INFORMATION I HAVE SUBMITTED INFORMATION I HAVE	CURA	ATE AND CORRECT	11/29/16	
Signature of Well Briller in Charge of Construction	W	D License #	Date	

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

# STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

## WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

FAX: 302-739-7764	-Authorization Number-
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	#
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD
Permit #: 255719 Local ID: MW - 18  Tax Map/Parcel #: 234-22.00-10.00	Auger DBored DMud Rotary Driver DJetted DAir Rotary DCable Tool DWashed DRayers Retarn
Property Owner: Sussex County, Delaware	☐Cable Tool ☐Washed ☐Reverse Rotary ☐Other (Specify):
Water Well Contractor: WILIC#: 919	Total Depth Of Excavation (Feet BGS): 22
Well Driller In Charge During Construction: Michael Hyrus	Construction Date: 9/26/2016
<u> </u>	Construction Date.
CASING INSTALLATION: INNER OUTER (1) (2) (	SCREEN INSTALLATION:
Casing Top (Inches AGS):	Screen Top (Feet BGS):
Casing Bottom (Feet BGS): 12 Casing Diameter (Inches): 2	
Casing Material: Sch 40 PVC	Screen Diameter (Inches): Screen Material:
Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below	
WELL USE:	TYPE OF PERMANENT PUMP INSTALLED:
☐ Domestic ☐ Industrial ☐ Heat Pump Supply	
☐ Irrigation ☐ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump	Pump Manufacturer: Horsepower:
☐ Agricultural/Lawn Irrigation	Rated Capacity:(GPM) Pump Intake Setting(ft. BGS):
Other (Specify) VONTOY WELL	Pump Type:   Submersible   Jet   Vertical Turbine Pump
#18	Pump Installed By:   Others Date:
Gravel Pack: From: D Feet To: 22 Feet	Site Plan - If different from original application, <u>must</u> note changes such as
	distances from well to house, property lines, nearest road, and all nearby septic
Other: From: Feet To: Feet	systems and central sewer lines (included suitable plot plan if available).
Type Of Non-Grout Backfill Of Well Annulus: Bertonte Growt	of steeling and contract steeling and contra
From:Feet To:Feet	
Static Water Level: 15 Feet Below	
Pumping Water Level:Feet On (Date):	
After:Hours Pumping Rate: GPM	
Pumping Method /Device: Airlift  Mechanical (Pump) Other:	
Was A Geophysical Log Taken? ☐ Yes No If "Yes", By:	
WELL HEAD COMPLETION:	
Type: ☐ Pitless Adapter ☐ Standard "T"	
Well Pit  Pad Mount  Prother - Specify: Stick-Oa Abras, Gamle	
77 100 (7100	
West The Well Tag Attached in Accordance With Courant Regulations?	
Was The Well Tag Attached In Accordance With Current Regulations?  YES □ NO If "NO", Please Explain:	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT,
AAA I IL V	an 1000 all
MM#10	Signature - Well Driller in Charge of Well Construction
	4076
	Well Driller License # Date

FAX:302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS W	ILL BE RETURNEI	)	
PERMIT #: 255719	LOCAL ID#:	MW-18	
PROPERTY OWNER: Sussex (unity,	DE		
	ioriates	V	vc lic#: 919
DESCRIPTION		TOP OF STRATA	BOTTOM OF STRATA
Yellowich bown fine to me	dim	$\bigcirc$	10
sand trace to 15th, 5.77	•		
Very pale brown fin to	medium		
sand, there to some silt		10	22
•			
		·	
	WAR WAR WAR TO THE TOTAL THE T		
		######################################	
COMMENTS:			
	900-1-1-100-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-100-1-10	aka dari ka Miki Mahimuda ka Miki Masa ka Maha ka Maha ka Maha ka Maha ka Maha ka Maha Mah	
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT  Muchan Dilland			
Signature of Well Driller in Charge of Construction	W	D License #	Date

STATE OF DELAWARE

DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

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-Authorization Number-

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PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

**DIVISION OF WATER RESOURCES** 

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED DRILLING / EXCAVATION METHOD PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY Auger □Bored ☐Mud Rotary □Driver □Jetted □Air Rotary Tax Map/Parcel #: 234-2 □Cable Tool □Washed □Reverse Rotary □Other (Specify): Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Michael HVNLS Construction Date: CASING INSTALLATION: OUTER SCREEN INSTALLATION: (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch): WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply Pump Manufacturer: ☐ Irrigation □ Public ☐ Heat Pump Recharge Horsepower:\_ □ Agricultural □ Agricultural/Lawn Irrigation Monitor ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Rated Capacity: \_\_\_\_\_(GPM) Pump Intake Setting(ft. BGS):\_\_\_ Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: Others Date: 26 Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Feet Bentonite Clay Plug distances from well to house, property lines, nearest road, and all nearby septic Grout Type: 

Bentonite Clay

Cement From: 12 Feet To: 14 systems and central sewer lines (included suitable plot plan if available). Type Of Non-Grout Backfill Of Well Annulus: Bestonite From: O Feet To: 12 Feet Static Water Level: 15 Feet Below ☐ Above Ground Surface Pumping Water Level: Feet On (Date): After: Hours Pumping Rate: GPM Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other: Was A Geophysical Log Taken? 

Yes No If "Yes", By:\_\_\_\_\_ WELL HEAD COMPLETION: ☐ Pitless Adapter Type: ☐ Standard "T" ☐ Well Pit Well Head Completed: 18 Inches MAbove Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS If "NO", Please Explain: Signature - Well Driller in Charge of Well Construction Well Driller License #

FAX:302-739-7764

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944

# STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE – ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED			
PERMIT #: 255720 LOCAL ID#:	MW-19		
PROPERTY OWNER: Surge County DE			
WELL CONTRACTOR: Hymn 7 Associates	w	CLIC#: 911	
DESCRIPTION	TOP OF STRÁTA	BOTTOM OF STRATA	
Yellowish brown, Fin to melium	0	10	
sand, traic sill			
Yellow, fin to coarse sail trave			
to some silt	10	20	
Very pale brown, Fin to medium			
sand, little silt	20	26	
COMMENTS:			
COMMENTS:			
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT			
Muslan ) Papule	4026	11/291/16	
Signature of Well Driller in Charge of Construction	WD License #	Date	

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION, A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 FAX: 302-739-7764

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

**DIVISION OF WATER RESOURCES** 

-Authorization Number-ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED DRILLING / EXCAVATION METHOD PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY Auger □Bored □Mud Rotary 6Driver Tax Map/Parcel #: 234-22.00-8.00 □Jetted □Air Rotary □Cable Tool □Washed □Reverse Rotary □Other (Specify): Water Well Contractor: HVNLS & ASSOCIATES WC Lic #: 919 Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Michael Hynks Construction Date: CASING INSTALLATION: INNER OUTER SCREEN INSTALLATION: (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): 2 AGS=Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch): Q WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply Pump Manufacturer: ☐ Irrigation □ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Agricultural/Lawn Irrigation Monitor Rated Capacity: \_\_\_\_\_(GPM) Pump Intake Setting(ft. BGS):\_\_\_\_ Other (Specify) Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: ☐ Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Feet distances from well to house, property lines, nearest road, and all nearby septic Grout Type: 

Bentonite Clay Cement Bentonite Clay Plug From: 6 Feet To: 8 systems and central sewer lines (included suitable plot plan if available). Type Of Non-Grout Backfill Of Well Annulus: 501701116 From: O Feet To: 6 Static Water Level: 7 Feet Below ☐ Above Ground Surface Pumping Water Level: Feet On (Date): After: Hours Pumping Rate: GPM Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other: Was A Geophysical Log Taken? Tyes No If "Yes", By:\_\_\_\_\_ WELL HEAD COMPLETION: Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit JOther-Specify: Stick-Up About Grede Well Head Completed: 18 Inches Above Below Ground Surface Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS If "NO", Please Explain: Signature - Well Driller in Charge of Well Construction Well Driller License #

FAX: 302-739-7764

WATER SUPPLY SECTION **DIVISION OF WATER RESOURCES** 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED		
PERMIT#: 255721 LOCAL ID#:	MW-20	
PROPERTY OWNER: SUSSEX (unty, DE		
WELL CONTRACTOR: Hypers 3 Associates	wo	CLIC#: 919
DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
Light yellowish brown, fine to milion	0	8
sent trace to little silt trace day		
Yellow, five to coase sand, trace to	8	14
little silk		
White, fine to motion sand, trace	14	20
to little silt		
	·	
COMMENTS:		
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURA  Magnet Difference of the Company of	ATE AND CORRECT	11/29/16
	D License #	Date

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

AND ENVIRONMENTAL CONTROL

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89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

DIVISION OF WATER RESOURCES

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED DRILLING / EXCAVATION METHOD PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY □Auger □Bored ☐Mud Rotary Tax Map/Parcel #: 234 - 2 □ Driver □Jetted □Air Rotary □Cable Tool □Washed □Reverse Rotary Property Owner: SUSSEX □Other (Specify): Water Well Contractor: Hunes Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Construction Date: CASING INSTALLATION: OUTER **SCREEN INSTALLATION:** (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): AGS=Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch) WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply Pump Manufacturer: ☐ Irrigation □ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Agricultural/Lawn Irrigation Rated Capacity: \_\_\_\_(GPM) Pump Intake Setting(ft. BGS):\_\_\_ Other (Specify)\_\_\_\_ Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: ☐ Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet distances from well to house, property lines, nearest road, and all nearby septic Grout Type: 

Bentonite Clay Cement Bentonite Clay Plug systems and central sewer lines (included suitable plot plan if available). From: Type Of Non-Grout Backfill Of Well Annulus: Bentonit Feet Static Water Level: Feet Below ☐ Above Ground Surface Pumping Water Level: Feet On (Date): After: \_\_\_\_\_ Hours Pumping Rate: \_\_\_\_ GPM Pumping Method /Device: Airlift Mechanical (Pump) Other:\_\_\_\_\_ Was A Geophysical Log Taken? ☐ Yes No If "Yes", By: WELL HEAD COMPLETION: Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit ☐ Pad Mount Other - Specify:\_ Well Head Completed: 18 Inches Above D Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS YES INO ACCURATE AND CORRECT. If "NO", Please Explain: Signature - Well Driller in Charge of Well Construction Well Driller License #

FAX: 302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

#### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

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PAGE_	<u></u> ΟF	PAGES

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL	BE RETURNED		
PERMIT #: 2557 22	LOCAL ID#:	MW-21	
PROPERTY OWNER: SUSSEX County De	Laware		
WELL CONTRACTOR: John D. Hynes &	Associat	es 1	WC LIC #: (0000) 9 9
DESCRIPTION		mon or ampama	DOTTOM OF COD A TIME
DESCRIPTION  Link Dan Tank Malay 2	l . า_	TOP OF STRATA	
Light Brown Fineto Medium Samo	I with	0	10
I race Sitt		16	<b></b>
Light Gray, Fine to Coarse Sar	ed with	10	20
I trace Silf			
Mw#2	***************************************		
•			·
-			***************************************
COMMENTS:			
I TEDEDA A FEDDA A FED			
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMIT	TED IS ACCURA	TE AND CORREC	11/29 //6
Signature of Well Driller in Charge of Construction	WI	D License #	Date

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

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#### WELL COMPLETION REPORT

PHONE: 302-739-9944

89 KINGS HIGHWAY

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

**DIVISION OF WATER RESOURCES** 

-Authorization Number-FAX: 302-739-7764 ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY DRILLING / EXCAVATION METHOD Auger □Bored ☐Mud Rotary Driver □Jetted □Air Rotary Tax Map/Parcel #: □Cable Tool □Washed - Reverse Rotary Property Owner: 5USSEX □Other (Specify): Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Construction Date: CASING INSTALLATION: INNER OUTER SCREEN INSTALLATION: (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): Screen Slot Size (1000 of an Inch): AGS=Above Ground Surface BGS=Below Ground Surface WELL USE: TYPE OF PERMANENT PUMP INSTALLED: ☐ Domestic □ Industrial ☐ Heat Pump Supply ☐ Irrigation □ Public Pump Manufacturer: ☐ Heat Pump Recharge Horsepower: ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump Rated Capacity: \_\_\_\_\_ (GPM) Pump Intake Setting(ft. BGS): Agricultural/Lawn Irrigation Other (Specify) Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: ☐ Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Feet Grout Type: 

Bentonite Clay Cement Bentonite Clay Plug distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available). From: Feet To: Type Of Non-Grout Backfill Of Well Annulus: 5011011 From: O Feet To: 6 Feet Static Water Level: 11 Feet Below ☐ Above Ground Surface Pumping Water Level: \_Feet On (Date):\_\_ After: Hours Pumping Rate: Pumping Method /Device: Airlift Mechanical (Pump) Other: Was A Geophysical Log Taken? ☐ Yes No If "Yes", By:\_ WELL HEAD COMPLETION: Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit Other - Specify: Well Head Completed: 18 Inches ★ Above □ Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT If "NO", Please Explain: Signature - Well Driller in Charge of Well Construction

FAX:302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

# STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

# **FORMATION LOG**

PLEASE PRINT OR TYPE – ILLEGIBLE OR INCOMPLETE FORMS	WILL BE RETURNE	0	
PERMIT #: 255723	LOCAL ID#:	NW-22	
PROPERTY OWNER: Sussex (unity) WELL CONTRACTOR: Hyper 3 Asse	DE		
WELL CONTRACTOR: Hyper & Asse	iriates	was a w	clic#: 919
DESCRIPTION	reger to the resource	TOP OF STRATA	BOTTOM OF STRATA
Yellowish brown. Fin to ma	lium sand	0	6
trace to some city			
Very pale brum, fin to prot	ium sand.		
trace to little silt		6	12
Light gay, from to medium	sanl,		
trace to little silt	•	12	20
COMMENTS:			
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMIT	TTED IS ACCURA	ATE AND CORRECT	11/29/16
Signature of Well Briller in Charge of Construction	W	D License #	Date

WATER SUPPLY SECTION

DOVER, DELAWARE 19901

89 KINGS HIGHWAY

DIVISION OF WATER RESOURCES

STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES

AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

#### WELL COMPLETION REPORT

PHONE: 302-739-9944 -Authorization Number-FAX: 302-739-7764 ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY DRILLING / EXCAVATION METHOD Auger Local ID: □Bored □Mud Rotary □Driver □Jetted □Air Rotary Tax Map/Parcel #: □Washed □Cable Tool □Reverse Rotary □Other (Specify): Water Well Contractor: Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: Construction Date: CASING INSTALLATION: INNER OUTER SCREEN INSTALLATION: (1) (2) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches): Screen Diameter (Inches): Casing Material: Screen Material: Gravel Pack Size (#): AGS=Above Ground Surface BGS=Below Ground Surface Screen Slot Size (1000 of an Inch WELL USE: TYPE OF PERMANENT PUMP INSTALLED: □ Domestic □ Industrial ☐ Heat Pump Supply ☐ Irrigation Pump Manufacturer: □ Public ☐ Heat Pump Recharge ☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation 10nit Rated Capacity: \_\_\_\_\_ (GPM) Pump Intake Setting(ft. BGS): ✓ Other (Specify) Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump Pump Installed By: Others Date: Site Plan - If different from original application, must note changes such as Gravel Pack: From: Feet Grout Type: ☐ Bentonite Clay ☐ Cement Bentonite Clay Plug distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available). From: O Feet To: Type Of Non-Grout Backfill Of Well Annulus: Penton Ite Grout Feet To: (0 Feet Static Water Level: 11 Feet ₩ Below ☐ Above Ground Surface Pumping Water Level: Feet On (Date): After: \_\_\_\_\_Hours Pumping Rate: \_\_\_\_\_ GPM Pumping Method /Device: Airlift Airlift Mechanical (Pump) Other:\_\_\_\_ Was A Geophysical Log Taken? ☐ Yes ☐ No If "Yes", By:\_\_\_ WELL HEAD COMPLETION: ☐ Pitless Adapter Type: ☐ Standard "T" ☐ Well Pit ☐ Pad Mount Other - Specify: Well Head Completed: If Inches Above Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations? I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS If "NO", Please Explain: ACCURATE AND CORRECT. Signature - Well Driller in Charge of Well Construction

FAX: 302-739-7764

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WIL			
PERMIT #: 255724	LOCAL ID#:	MW-2:	3
PROPERTY OWNER: SUSSEX County Del	aware		
WELL CONTRACTOR: John D. Hunes &	Associate	S	wclic#: (600 919
DESCRIPTION		TOP OF STRATA	A BOTTOM OF STRATA
Light Brain. Fine to Medium San Light Coray, Fine to Coarse Sand T	d Trace Silt	0	10
Light Coray, Fine to Coarse Sand T	race to Little	10	20
Sit			
MW+23			
COMMENTS:			
***************************************			
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMI	TTED IS ACCURA	TE AND CORRE	CT 11/27 /1C
Signature of Well Driller in Charge of Construction	W.	D License #	Date

WATER SUPPLY SECTION

DIVISION OF WATER RESOURCES

STATE OF DELAWARE

DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT **MUST BE RETURNED WITHIN 30** DAYS OF CONSTRUCTION. A

89 KINGS HIGHWAY WELL FORMATION LOG MUST BE DOVER, DELAWARE 19901 WELL COMPLETION REPORT INCLUDED WITH THIS REPORT. PHONE: 302-739-9944 -Authorization Number-FAX: 302-739-7764 ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED DRILLING / EXCAVATION METHOD PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY Auger □Bored ☐Mud Rotary □Driver □Jetted □Air Rotary Tax Map/Parcel #: □Cable Tool □ Washed □Reverse Rotary □Other (Specify): Total Depth Of Excavation (Feet BGS): Well Driller In Charge During Construction: MIC Construction Date: CASING INSTALLATION: SCREEN INSTALLATION: INNER OUTER (1) (2) (3) Casing Top (Inches AGS): Screen Top (Feet BGS): Casing Bottom (Feet BGS): Screen Bottom (Feet BGS): Casing Diameter (Inches)

Casing Material: Gravel Pack Size (#): 2  AGS=Above Ground Surface BGS=Belo	Screen Material: Sch. 40PVC w Ground Surface Screen Slot Size (1000 of an Inch): O. O.O.O."
WELL USE:	
☐ Domestic ☐ Industrial ☐ Heat Pump Supply	TYPE OF PERMANENT PUMP INSTALLED:
☐ Irrigation ☐ Public ☐ Heat Pump Recharge	Pump Manufacturer: Horsepower:
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump	
Agricultural/Lawn Irrigation Monitor Well	Rated Capacity: (GPM) Pump Intake Setting(ft. BGS):  Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump
#24	Pump Installed By:   ☐ Others Date:
Gravel Pack: From:	Site Plan - If different from original application, <u>must</u> note changes such as
Grout Type: ☐ Bentonite Clay ☐ Cement 💥 Bentonite Clay Plug	distances from well to house, property lines, nearest road, and all nearby septic
Other: From: 6 Feet To: 8 Feet	systems and central sewer lines (included suitable plot plan if available).
Type Of Non-Grout Backfill Of Well Annulus: Bentonite Grout  From: Feet To: Feet	
Static Water Level: 13 Feet Below Above Ground Surface	
Pumping Water Level:Feet On (Date):	
After:Hours Pumping Rate:GPM	
Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other:	
Was A Geophysical Log Taken? ☐ Yes ☐ No If "Yes", By:	
WELL HEAD COMPLETION:	
Type: ☐ Pitless Adapter ☐ Standard "T"	
□ Well Pit □ Pad Mount	
Lother-Specify: Stick-Up Above Grade	
Well Head Completed: 18 Inches   Above □ Below Ground Surface	
Was The Well Tag Attached In Accordance With Current Regulations?	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
YES NO If "NO", Please Explain:	ACCURATE AND CORRECT.
MW # 24	Marvel & Thyse
1 111 - 21	Signature - Well Driller in Charge of Well Construction

Well Driller License #

Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

FAX: 302-739-7764	PAGI	E OF PAGES
PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNI	ED	<del>,</del>
PERMIT #: 255725 LOCAL II	D#: 234 - 22.00	-8.00 (MW-2
PROPERTY OWNER: Susses County DE		
WELL CONTRACTOR: John D. Hynes & ASSOCIO	utes we	CLIC#: <b>(200)</b> 919
DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
Light Brown, Fine to Medium Sand,		8
with I race to Little Silt		
Light Gray, Fine to Medium Sand	8	20
with Track to Little Silt		
MW#24		
•		
	-	
COMMENTS:		
	***************************************	
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACC	CURATE AND CORRECT	11/29/16
Signature of Well Driller in Charge of Construction	WD License #	Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

#### STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

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### WELL COMPLETION REPORT

PHONE: 302-739-9944

PHONE: 302-739-9944 FAX: 302-739-7764	-Authorization Number-
ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED  PLEASE PRINT OR TYPE LISE BLUE OR DIA OK DAY ON Y	# DRILLING / EXCAVATION METHOD
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	
Permit #: 255726 Local ID: MW - 25	Auger DBored DMud Rotary
Tax Map/Parcel #: 234-22.00-8.00	□Driver □Jetted □Air Rotary □Cable Tool □Washed □Reverse Rotary
Property Owner: SUSSEX County, DE LANGE	Other (Specify):
Water Well Contractor: Tynes : Associates WC Lig #: 919	Total Depth Of Excavation (Feet BGS): 20
Well Driller In Charge During Construction: Michael Hynes	Construction Date: 9/16/2016
CASING INSTALLATION: INNER OUTER	SCREEN INSTALLATION:
Casing Top (Inches AGS): 36 (1) (2)	(3)
Cosing Dodger (Part DCG)	Screen Top (Feet BGS):  Screen Bottom (Feet BGS):
Casing Diameter (Inches):	Screen Diameter (Inches):
Casing Material: Sch. 40 PVC	Screen Material: Sch.40 PVC
Gravel Pack Size (#): 2  AGS=Above Ground Surface BGS=Belo	ow Ground Surface Screen Slot Size (1000 of an Inch): O.O.O.
WELL USE:	7
☐ Domestic ☐ Industrial ☐ Heat Pump Supply	TYPE OF PERMANENT PUMP INSTALLED:
☐ Domestic ☐ Industrial ☐ Heat Pump Supply ☐ Irrigation ☐ Public ☐ Heat Pump Recharge	Pump Manufacturer: Horsepower:
	•
Agricultural Misc. Public Closed Loop Heat Pump Agricultural/Lawn Irrigation Other (Specify)	Rated Capacity:(GPM) Pump Intake Setting(ft. BGS):
Other (Specify)	Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
# 25	Pump Installed By: Dothers Date:
Gravel Pack: From: Feet To: 20 Feet	Site Plan - If different from original application, <u>must</u> note changes such as
Gravel Pack: From: Feet To: Feet  Grout Type: Bentonite Clay Cement Bentonite Clay Plug	distances from well to house, property lines, nearest road, and all nearby septic
Other: From: Feet To: Feet	systems and central sewer lines (included suitable plot plan if available).
Type Of Non-Grout Backfill Of Well Annulus: Bertontle Grout	systems and contrar serier intes (moraded surrante prot plan is available).
From: 6 Feet To: 6 Feet	
Static Water Level:   Feet   Below   Above Ground Surface	
Pumping Water Level:Feet On (Date):	
After:Hours Pumping Rate: GPM	
Pumping Method /Device: Airlift Mechanical (Pump) Other:	
Was A Geophysical Log Taken? ☐ Yes No If "Yes", By:	
WELL HEAD COMPLETION:	
TOTAL TRIBES ADDITION TO TANGED "1"	
Type: ☐ Pitless Adapter ☐ Standard "T" ☐ Well Pit ☐ Pad Mount	
Well Pit Pad Mount  Other - Specify: Still - Of Ahor Grade	
Well Pit  Other - Specify:  Well Head Completed:  Inches  Above Below Ground Surface	
Well Pit Pad Mount Other - Specify: Shirle - Above Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations?	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
Well Pit  Other - Specify:  Well Head Completed:  Inches  Above Below Ground Surface	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.
Well Pit Pad Mount Other - Specify: Shirle - Above Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations?	accurate and correct.
Well Pit Pad Mount Other - Specify: Shirle - Above Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations?	
Well Pit Pad Mount Other - Specify: Shirle - Above Below Ground Surface Was The Well Tag Attached In Accordance With Current Regulations?	accurate and correct.

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944 FAX:302-739-7764

### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

PLEASE PRINT OR TYPE – ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNE	č <b>D</b>	
PERMIT #: 255726 LOCAL ID#:	MW-25	
PROPERTY OWNER: Sunex County, DE		
WELL CONTRACTOR: Hymn 3 Associates		WCLIC#: 119
DESCRIPTION	TOP OF STRAT	A BOTTOM OF STRATA
Pale brown, Fin to makeum sary, France	. 0	8
517		
Very pale brum fine to roose sand	4	
train silt, trace day	8	20
/		
	<b>!</b>	
COMMENTS:		
		······································
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCUR.	ATE AND CORREC	11/29/16
Signature of Well Driller in Charge of Construction	VD License #	Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

FAX: 302-739-7764

# STATE OF DELAWARE DEPARTMENT OF NATURE RESOURCES AND ENVIRONMENTAL CONTROL

### WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION. A WELL FORMATION LOG MUST BE INCLUDED WITH THIS REPORT.

-Authorization Number-

ILLEGIBLE OR INCOMPLETE FORMS WIIL BE RETURNED	
PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY	DRILLING / EXCAVATION METHOD
Permit #: 255 72 7 Local ID: MW - 26  Tax Map/Parcel #: 234-22.00-8.00  Property Owner: SUSSEX COUNTY DE MOYE  Water Well Contractor: Hynes & ASSOC WC Lic #: 419  Well Driller In Charge During Construction: MICHAEL HYNES	Auger
CASING INSTALLATION: INNER OUTER  Casing Top (Inches AGS): Casing Bottom (Feet BGS): Casing Diameter (Inches): Casing Material: Gravel Pack Size (#):  WELL USE:	SCREEN INSTALLATION:  Screen Top (Feet BGS): Screen Bottom (Feet BGS): Screen Diameter (Inches): Screen Material: Screen Slot Size (1000 of an Inch):  Screen Slot Size (1000 of an Inch):
□ Domestic □ Industrial □ Heat Pump Supply □ Irrigation □ Public □ Heat Pump Recharge □ Agricultural □ Misc. Public □ Closed Loop Heat Pump □ Agricultural/Lawn Irrigation MONTOR WOIL  Other (Specify)	TYPE OF PERMANENT PUMP INSTALLED:  Pump Manufacturer: Horsepower:  Rated Capacity: (GPM) Pump Intake Setting(ft. BGS):  Pump Type: □ Submersible □ Jet □ Vertical Turbine Pump  Pump Installed By: □ Others Date:
Gravel Pack: From:	Site Plan - If different from original application, <u>must</u> note changes such as distances from well to house, property lines, nearest road, and all nearby septic systems and central sewer lines (included suitable plot plan if available).
Was The Well Tag Attached In Accordance With Current Regulations?  YES DO If "NO", Please Explain:	I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.  Signature - Well Driller in Change of Well Construction  Well Driller License #  Date

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901 PHONE: 302-739-9944

### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST BE RETURNED WITHIN 30 DAYS OF CONSTRUCTION DATE

FAX: 302-739-7764		PAG	E PAGES
PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETU	URNED		
PERMIT #: 255727 LOCA	AL ID#:	MW-24	2
PROPERTY OWNER: Sussex Courty Delaw	are		
WELL CONTRACTOR: John & Hunes & Ass	ociat	es w	clic#: <b>(1336</b> 919)
DESCRIPTION		TOP OF STRATA	BOTTOM OF STRATA
			10
Light Brown, Fire to Medium Sand Trace Light Gray, Fine to Coarse Sand Trace	Co C-14	10	2/4
Light Gray, Fire to Course said that	T DIL	<u> </u>	a Q
MW# 26			
VIII0 20		***************************************	
		***************************************	
			<u></u>
COMMENTS:			
	<del></del>		
	, <u></u>		
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS	ACCURA	TE AND CORRECT	11/29/16
Signature of Well Driller in Charge of Construction	- <del>- /</del> WD	License #	Date

Geologic Le	og of Boring: B—/	Page / of /
	Bays Regional Wastewater Facilities, Sus	
	sex County, DE Engineering Department	,, =
	pany: John D. Hynes & Assoc., Inc.	Date: 10-12-16
	llow-stem auger and split spoon sampling	2010, 1, 1, 2, 1, 2
	nicki of WRA	
		artin Atlanta
depth (ft.)		ription
0-2	Moist brown the quarty	SHIP PIACE SILL
0 11	Moist brown fine	anarty SAND trace sitt
4-1-	(same)	supring Shire Hace sive
1-8	Ma est brown fine:	to medium quarty SAND
8-10	Moist orange - brown	La areas
10	fine to medium que	the gray
10-12	Wet Light graves br	
7		yartz SAND
12-14		fine to medium
		ace subrounded
	guartz gravel	
14-16	Wet gray fine quart	Z SAND
		black grains
16-18		fine to medium
	GHARTZ SAND	
18-20	West gray (trace	rad) medium to coarse
	guartz SAND	
Principal con	nponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little = 10 -	20% trace = 1 - 10%

Geologic Lo	og of Boring:	B-2		Page of
Site: Inland	Bays Regional	Wastewater Facilities	s, Sussex County, D	)elaware
Client: Suss	ex County, DE	Engineering Departn	nent	
Drilling comp	oany: John D. I	Hynes & Assoc., Inc.		Date: 10-12-2016
Method: hol	low-stem auge	and split spoon sam	pling	
By: S. Mogil	nicki of WRA		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
depth (ft.)			description	_
0-7	Moist:	brown fine	quarta Si	AND trace silt
2-4	(	same)	0	
4-6		(same)		
10-80	Moist	brown to pra	nge-trown	fine tomedium
	Alla	rtz SAND	0	
8-10	Dun	(came)		3
10-12		(same)	5	
12-14	Moist	light gray a	nd brown	fine to medium
	quart.	Z SAND to	ace silt to	race black
	organ	ric matter	-	
14-16	Wet.	light gray (	trace black	) fine to medium
11 10	Guar	TE SAND	trace silt	
16-18	Wet	ight gray Ct	race red)	medium to coarse
10 0-	quar	TE SAND		
18-20	(5	rame)		
•				
		b.		
	- 3			
				, e
	nponent(s) in C = 35 - 50%, sor	APITALS. ne = 20 - 35%, little :	= 10 - 20%, trace =	1 - 10%.

Geologic Lo	og of Boring: B-3	Page / of /	
Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware			
Client: Suss	ex County, DE Engineering Department	4	
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: 9-28-2016	
	low-stem auger and split spoon sampling		
By: S. Mogili			
depth (ft.)		ription	
0-2	Moist brown fine to mea	lium quartz SAND	
2-4	(same)		
4-6	Moist gravish brown	fine to medium	
•	quarte SAND tra	esilt	
	trace black organ	ic matter	
6-8	Moist light brown -	fine quartz SAND	
<u> </u>	trace sitt		
8-10	Moist gray time que	ertz SAND trace silt	
10-12	Moist gray SILT	trace fine sand	
12-14	Wet gray time to "	redrum quarte SAND	
14-16	Wet gray to orange	- Drown SILT	
16-18	trace cruy, trac	e the sand	
16-10	West orange - Diblon	Measure 1 course	
	Sularous and all Gue	act clas	
18-20	(same)	iriz giovei	
18-20	Garne)		
•			
		1 11 11 11 11 11 11 11 11 11 11 11 11 1	
	<u> </u>		
	·	1112	
	the second secon		
Principal con	nponent(s) in CAPITALS.		
	= 35 - 50%, some = 20 - 35%, little = 10 -	20%, trace = 1 - 10%.	

Geologic Lo	og of Boring:	B-4		Page / of /
Site: Inland	Bays Regional \	<b>Vastewater Facilities</b>	s, Sussex County, Delaw	/are
Client: Suss	ex County, DE I	Engineering Departn	nent	
Drilling comp	pany: John D. H	ynes & Assoc., Inc.	Da	ate: 9-28-2016
Method: hol	low-stem auger	and split spoon sam		
By: S. Mogili	nicki of WRA	The state of the s		
depth (ft.)			description	
0-2	Moist	brown fine	quartz SANT	trace sitt
2-4	(9	ame)		
4-6	(50	ame)		
6-8		Drown to		n SILT
0 10		ace fine sa		
8-10	Moist	white to	orange-brow	n
	fine	quartz SA	VD, little SI	lt
10-12	M0151	gray to oce	inge-prown	5141
10.11	tra	ce tine se	and	
12-14	Wet, o	range - Drow	un finequarts	z SAND
171 11	Tra	cesilt		
14-16	(Sa	me)		
16-18	Wet	gray tine -	omedium g	wartt SAND
18-20	(50	ne)		
		<b>b</b>		
				(4)
				287
Principal con	nponent(s) in CA	APITALS.		
			= 10 - 20%, trace = 1 - 1	10%.

Geologic Lo	og of Boring:	B-5	Page' /of /
			es, Sussex County, Delaware
		Engineering Depart	tment
Drilling comp	pany: John D. H	lynes & Assoc., Inc	Date: 9-27-2016
Method: hol	llow-stem auger	and split spoon sa	
By: S. Mogil	nicki of WRA		
depth (ft.)			description
0-2	Moist I	brown fine	quartz SAND trace silt
2-4	(san		
4-6	(50)	ne)	
6-8	Dry	yellowish	brown finequarte SAND
m .	, li	Hle silt	
8-10	- (5an	1e)	
10-12	Dry li	7ht-Drowe	ace black organic matter
10 14			
12-14	ver u	1/	
111-110	Wet 91	(	prown, dark brown
17-10	Web 91.	to medium	- 4 1-
16-18	1110+ 1		o gray fine quartz SAND
18-20		rown to ora	nge- brown (trace white black)
10 00	fine		AND
	2		
•			
	-		
Principal con	mponent(s) in CA	APITALS.	
			e = 10 - 20%, trace = 1 - 10%,

Geologic Lo	ng of Boring:	B-6		Page / of /
		astewater Facilities,	Sussex County, De	laware
		ngineering Departme		
Drilling comp	pany: John D. Hy	nes & Assoc., Inc.		Date: 9-28-2016
Method: hol	low-stem auger a	nd split spoon samp	ling	
By: S. Mogilr	nicki of WRA	101		
depth (ft.)			description	
0-2	Moist Li	ght brown t	ine quartz	SAND trace silt
2-4	(sam	e)		
4-6	Moist r	Eddish brow	un finequ	artz SAND
	trace	sitt		
6-8	Dry ligh	it brown to	gray fine	quartz SAND
	Son	e sitt	0 0	
8-10	(Same			
10-12	(sar	ne)		
12-14	Moist DI	ange- Drowr	tine to m	nedium
	qua	rtz SAN	D	, , , , , , , , , , , , , , , , , , , ,
14-16	Wet	light brown	to brange	- brown
	fine	quartz 5	AND trace	esilt
16-18	Wet lig	ht brown	to gray	11*5
10 -	fine to	medium 9	quartz St	HND
18-20	(san	ie) i	· 	
-				
	*			
				=
		b.		
				· · · · · · · · · · · · · · · · ·
	nponent(s) in CAI			
Minor: and =	= 35 - 50%, some	e = 20 - 35%. little =	10 - 20%, trace = 1	l - 10%

Geologic L	og of Boring: $B-7$	Page / of /
	Bays Regional Wastewater Facilities, Sussex Co	ounty, Delaware
Client: Sus	sex County, DE Engineering Department	
Drilling com	pany: John D. Hynes & Assoc., Inc.	Date: 9-27-2
Method: ho	llow-stem auger and split spoon sampling	
By: S. Mogi	Inicki of WRA	
depth (ft.)	description	
0-2	Moist brown fine quart	& SAND traces
2-4	(same)	
4-6	(same)	
6-8	(same)	
8-10	Moist brange- brown	
10-12	Moist light homen for	neguartz SANI
10 12	trace Eilt	regularity MIVI
12-14	(Same)	
14-16		ine quarta SAI
11 10	trace black organic	0 11
16-18	Wet orange- brown t	ne quartz SA
18-20	Wet gray fine quartz	- SAND
10	trace black organ	ic matter
•		
	*	
	6	

		anness of the same		, ,
Geologic Lo	og of Boring:	B-8		Page / of /
		Nastewater Facilities	, Sussex County, D	elaware
Client: Suss	sex County, DE	Engineering Departm	ent	
Drilling comp	oany: John D. F	lynes & Assoc., Inc.		Date: 9-28-2016
Method: hol	low-stem auger	and split spoon sam	oling	
By: S. Mogil	nicki of WRA			4
depth (ft.)			description	
0-2	Moist	dark brown	fine to me	dium quarte SAND
2-4	Moist	brown Ane q	uartz SAN	D trace silt
4-6	150	me)		D HACE SIDE
6-2		ame)		
8-10	(san	18)		
10-12	Moist 1	rown fine g	wartz SAM	ID trace silt
12-14	(sar			
14-16	(sa	me)		
16-18	Moist	prange-b	own fine	tomedium
7	91	vartz SA	ND	
18-20	Dry	gray CLA'	Y trace Si	lt
,		, ,	,	
			to?"	
				-
		-t		
•				
		<b>b.</b>		
	T			····
		-11		
Principal con	nponent(s) in CA	PITALS		
		e = 20 - 35%, little =	10 - 20%, trace =	1 - 10%.

Geologic Lo	og of Boring: $B-9$ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	ex County, DE Engineering Department
	pany: John D. Hynes & Assoc., Inc. Date: 10-31-2016
	low-stem auger and split spoon sampling
	nicki of WRA
depth (ft.)	description Class
0-2	Dry light brown fine quartz SAND
2 1/	trace sitt
2-4	Dry orange-brown fine quarte SAND
// /	trace sitt
4-6	Moist orange-brown fine to medium
6-8	Moist light brown fine quarty SAND
	trace silt
8-10	Moist light brown fine to medium
	GUARTZ SAND
10-12	Wet brown to gray fine to medium
	Guarty SAND
12-14	Wet brown to gray (trace white, black)
	fine to medium quartz SAND
14-16	Wet orange-brown fine to medium
	auartz SAND
16-18	Wet gray (trace black) time to medium
	Guartz SAND
18-20	Wet gray (trace red black)
	fine quart 7 SAND
•	
	b.
	į.
	nponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $B-ID$	Page / of /
	Bays Regional Wastewater Facilities, Sussex Cou	inty, Delaware
	sex County, DE Engineering Department	
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: /0-12-16
	llow-stem auger and split spoon sampling	
	nicki of WRA	
depth (ft.)	description	g.
0-2	Moist brown fine quarta S	AND trace silt
2-4	(same)	
4-6	(same)	
6-8	Wet brown fine to medium	quartz SAND
	trace black organic matte	C
8-10	Wet propon fine to medi	um quartz SHIVD
10-12	Net light gray (trace re	ed) time to medium
	quartz SAND	
12-14	Wet orange-trown time	to medium
111 17	Guartz SAND	
14-16	Wet medium to course	
11 10		yellow quartz gravel
16-18	West gray to brown tine to	black organic matter
10 0	quartz SAND Trace	
18-20		quarta SAND
	Trace silt	<i>b</i>
•		
	•	
	110011	
	2	
		49 3
		(et)
Principal con	mponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, tr	ace = 1 - 10%.

Geologic Log of Boring: B-// Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware Client: Sussex County, DE Engineering Department Drilling company: John D. Hynes & Assoc., Inc.  Method: hollow-stem auger and split spoon sampling By: S. Mogilnicki of WRA  depth (ft.)  O-2. Moist Light brown fine to medium  quartz SAND trace silt  4-lo Moist Light brown for orange-frown  fine to medium quartt SAND  trace silt  b-8  Square  B-10 Wet Wight brown fine to medium  quartz SAND  frace silt  IO-12 Why grayish brown fine SAND  Soone silt  14-lo Wet orange-brown (trace black)  fine to medium quartz SAND  Medium to Coarse quartz SAND			
Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware Client: Sussex County, DE Engineering Department Drilling company: John D. Hynes & Assoc, Inc.  Date: 10-31-2016 Method: hollow-stem auger and split spoon sampling By. S. Mogilnicki of WRA  depth (ft.)  0-2. Moist Light brown fine to medium  guartz SAND trace silt  4-6 Moist Light brown fo orange-brown fine to medium quartz SAND  trace silt  6-8 (Same) 8-10 Wet light brown fine to medium  guartz SAND trace silt  10-12 Wet grayish brown fine to medium  guartz SAND trace silt  12-14 Wet grayish brown fine SAND  Some Silt  14-16 Wet orange-brown (trace black) fine to medium quartz SAND  18-20 Wet orange-brown (trace black) Medium to Coarse quartz SAND	Geologic Lo	og of Boring: $B-//$	Page / of /
Client: Sussex County, DE Engineering Department Drilling company: John D. Hynes & Assoc., Inc.  Method: hollow-stem auger and split spoon sampling By: S. Mogilinicki of WRA  depth (ft.)  0-2 Moist light brown fine to medium  quartz SAND trace silt  2-4 (same)  4-6 Moist light brown fo orange-brown fine to medium quartt 9AND  trace silt  6-8 (same)  8-10 Wet grayish brown fine to medium  quartz SAND trace silt  10-12 Wet grayish brown fine sand 12-14 Wet grayish brown fine SAND  12-14 Wet grayish brown fine SAND  14-16 Wet orange-brown (trace black) fine to medium quartz SAND  18-20 Wet orange-trown (trace black) fine to medium to Coarse quartz SAND			
Drilling company: John D. Hynes & Assoc., Inc.  Method: hollow-stem auger and split spoon sampling  By: S. Mogilnicki of WRA  depth (ft.)  O-2 Moist light brown fine to medium  quartz SAND trace silt  2-4 (Same)  4-6 Moist light brown fo orange brown  fine to medium quartt 9AND  trace silt  6-8 (Same)  8-10 Wet light brown fine to medium  quartz SAND trace silt  10-12 Wet grayish brown fine sand  12-14 Wet grayish brown fine SAND  Some silt  14-16 Wet orange brown (trace black)  fine to medium quartz SAND  18-20 Wet orange brown (trace black)  medium to Coarse quartz SAND			
Method: hollow-stem auger and split spoon sampling  By: S. Mogilnicki of WRA  depth (ft.)  0-2 Moist light brown fine to medium  quartz SAND trace silt  2-4 (Same)  4-6 Moist light brown to orange-brown  fine to medium quartt 9AND  trace silt  6-8 (Same)  8-10 Wet light brown fine to medium  quartz SAND trace silt  10-12 Wet grayish brown 51LT  thace fine sand  12-14 Wet grayish brown fine SAND  Some silt  14-16 Wet orange-brown (trace black)  fine to medium quartz SAND  16-18 Wet orange-brown (trace black)  fine to medium quartz SAND  18-20 Wet orange-brown (trace black)  predium to Coarse quartz SAND			Date: 10-31-2016
depth (ft.)  0-2 Moist light brown fine to medium  guartz SAND trace silt  2-4 (Same)  4-6 Moist light brown to orange-brown fine to medium guartz SAND  trace silt  6-8 (Same)  8-10 Wet light brown fine to medium guartz SAND trace silt  10-12 Wet grayish brown 5/LT  trace fine sand  12-14 Wet grayish brown fine SAND  12-14 Wet grayish brown fine SAND  14-16 Wet orange-brown (trace black) fine chartz SAND  16-18 Wet orange-brown (trace black) fine to medium guartz SAND  18-20 Wet orange-trown (trace black) Medium to Coarse quartz SAND			
0-2 Moist light brown fine to medium  quartz SAND trace Silt  (same)  4-6 Moist light brown to erange-brown fine to medium ghartz SAND  trace Silt  6-8 (Same)  8-10 Wet light brown fine to medium guartz SAND trace Silt  10-12 Wet grayish brown SILT  trace fine sand  12-14 Wet grayish brown fine SAND  Some Silt  14-16 Wet orange-brown (trace black)  fine guartz SAND  16-18 Wet orange-brown (trace black) fine to medium quartz SAND  18-20 Wet orange-trown (trace black) medium to Coarse guartz SAND	By: S. Mogili	nicki of WRA	
0-2 Moist light brown fine to medium  quartz SAND trace Silt  (same)  4-6 Moist light brown to erange-brown fine to medium ghartz SAND  trace Silt  6-8 (Same)  8-10 Wet light brown fine to medium guartz SAND trace Silt  10-12 Wet grayish brown SILT  trace fine sand  12-14 Wet grayish brown fine SAND  Some Silt  14-16 Wet orange-brown (trace black)  fine guartz SAND  16-18 Wet orange-brown (trace black) fine to medium quartz SAND  18-20 Wet orange-trown (trace black) medium to Coarse guartz SAND	depth (ft.)	descr	iption
guartz SAND trace Silt  2-4 (Same)  4-6 Moist light brown to orange-brown fine to medium quartt SAND  trace silt  6-8 (Same)  8-10 Wet light brown fine to medium guartz SAND trace silt.  10-12 Wet gravish brown fine SAND  12-14 Wet gravish brown fine SAND  12-14 Wet gravish brown fine SAND  14-16 Wet orange-brown (trace black) fine quartz SAND  16-18 Wet orange-brown (trace black) fine to medium quartz SAND  18-20 Wet orange-trown (trace black) medium to Coarse quartz SAND			·
4-6 Moist light brown to orange-brown fine to medium quart 3AND trace silt  6-8 (Same) 8-10 Wet light brown fine to medium guart & SAND trace silt.  10-12 Wet grayish brown \$1 LT trace fine sand  12-14 Wet grayish brown fine SAND  Some Sift  14-16 Wet orange-brown (trace black) fine guart & SAND  16-18 Wet orange-brown (trace black) fine to medium quart & SAND  18-20 Wet orange-trown (trace black) Medium to Coarse quart & SAND			
4-6 Moist light brown to orange-brown fine to medium quart 3AND trace 5: It  6-8 (Same) 8-10 Wet light brown fine to medium guart & SAND trace Silt.  10-12 Wet gravish brown fine SAND 12-14 Wet gravish brown fine SAND Some 5: It  14-16 Wet orange-brown (trace black) fine Guart & SAND  16-18 Wet orange-brown frace black) fine to medium quart & SAND  18-20 Wet orange-trown (trace black) medium to Coarse quart & SAND	2-4		
fine to medium quart & SAND  trace silt  (Same)  8-10 Wet light brown fine to medium  guart & SAND trace silt.  10-12 Wet gravish brown fine SAND  12-14 Wet gravish brown fine SAND  Some sift  14-16 Wet orange-brown (trace black)  fine Guart & SAND  16-18 Wet orange-brown ftrace black)  fine to medium quart & SAND  18-20 Wet orange-trown (trace black)  Medium to Coarse quart & SAND	4-6		to orange-brown
b-8 (Same) 8-10 Wet light brown fine to medium guartt SAND trace silt 10-12 Wet grayish brown \$1 LT trace fine sand 12-14 Wet grayish brown fine SAND 12-14 Wet grayish brown fine SAND 14-16 Wet orange-brown (trace black) fine Guartt SAND 16-18 Wet orange-brown (trace black) fine to medium guartt SAND 18-20 Wet orange-trown (trace black) Medium to Coarse quartt SAND	,		
6-8  8-10  Wet light brown fine to medium  guartt SAND trace silt  10-12  Wet gravish brown 5/LT  trace fine sand  12-14  Wet gravish brown fine SAND  Some Sift  14-16  Wet orange-brown (trace black)  fine guartt SAND  16-18  Wet orange-trown (trace black)  fine to medium guartt SAND  18-20  Wet orange-trown (trace black)  Medium to Coarse guartt SAND			1
8-10 Wet light brown fine to medium  guartz SAND trace silt  10-12 Wet grayish brown SILT  trace fine sand  12-14 Wet grayish brown fine SAND  Some silt  14-16 Wet orange-brown (trace black)  fine guartz SAND  16-18 Wet orange-brown frace black  fine to medium guartz SAND  18-20 Wet orange-trown (trace black)  medium to Coarse guartz SAND	6-8	(same)	
grant & SAND trace sitt  10-12 Wet gravish brown SILT  ttace fine sand  12-14 Wet gravish brown fine SAND  Some sift  14-16 Wet orange-brown (trace black)  fine quart & SAND  16-18 Wet orange-brown (trace black)  fine to medium quart & SAND  18-20 Wet orange-trown (trace black)  Medium to Coarse quart & SAND	8-10	Wet light brow	on fine to medium
10-12 Wet gravish brush SILT  thace fine sand  12-14 Wet gravish brown fine SAND  some Sift  14-16 Wet orange-brown (trace black)  fine quart; SAND  16-18 Wet orange-brown frace black)  fine to medium quart; SAND  18-20 Wet orange-trown (trace black)  medium to Coarse quart; SAND		aught & SAN	1
Principal component(s) in CAPITALS.	10-12	Wet gravish brow	0117
Some Sift  14-16 Wet orange-brown (traceblack)  fine Guartz SAND  16-18 Wet orange-brown (trace black)  fine to Medium guartz SAND  18-20 Wet orange-trown (trace black)  Medium to Coarse quartz SAND  .  Principal component(s) in CAPITALS.	•		
Some Sift  14-16 Wet orange-brown (traceblack)  fine Guartz SAND  16-18 Wet orange-brown (trace black)  fine to Medium guartz SAND  18-20 Wet orange-trown (trace black)  Medium to Coarse quartz SAND  .  Principal component(s) in CAPITALS.	12-14	Wet gravish brow	un fine SAND
fine Guartz SAND  16-18 Wet orange brown (trace black) fine to medium quartz SAND  18-20 Wet orange trown (trace black) Medium to Coarse quartz SAND  *  Principal component(s) in CAPITALS.		some silt	V.
16-18 Wet orange brown (trace black) fine to medium quart & SAND  18-20 Wet orange trown (trace black) medium to Coarse quart & SAND  Principal component(s) in CAPITALS.	14-16	Wet orange-bro	wn (trace black)
fine to medium quart & SAND  18-20 Wet orange- brown (trace black)  Medium to Coarse quart & SAND  Principal component(s) in CAPITALS.			SAND
18-20 Wet orange- trown (trace black) Medium to Coarse quart 2 SAND   Principal component(s) in CAPITALS.	16-18	Wet orange book	un frace black
Principal component(s) in CAPITALS.		fine to mediu	n quartz SAND
Principal component(s) in CAPITALS.	18-20	Wet orange- trou	in (trace black)
		medium to coas	se quartz SAND
		<b>6</b>	
		11-11-11-11-11-11-11-11-11-11-11-11-11-	
	Dain air - La : :	on an anti(a) in CADITAL C	
			0%, trace = 1 - 10% <sub>e</sub>

Geologic Lo	og of Boring: $B-12$	Page / of /		
	Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware			
	sex County, DE Engineering Depa	tment		
	pany: John D. Hynes & Assoc., In	1 1 - 1/		
	low-stem auger and split spoon sa			
By: S. Mogil	nicki of WRA			
depth (ft.)		description		
0-2	Moist brown fine	quartz SAND frace silt		
2-4		own fine to medium		
	quartz SAI	ID trace sitt		
4-6	Moist want bro	wn fine to medium		
	SAND to	ace sitt		
6-8	Wet light brow	on fino to medium		
	quartz SA	VD trace silt		
8-10	(same)			
10-12	(same)			
12-14	Wet brown to	gray medium to coarse		
	guartz SAN	D .		
14-16	Wet fine gray	quartz SAND		
16-18	(same)	C (J'		
18-20	(same)			
9-	_			
	•			
	b.			
	la .			
		<		
	mponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, litt	e = 10 - 20%, trace = 1 - 10%.		

Geologic Lo	og of Boring:	B-13		Page / of /	
Site: Inland	Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware				
Client: Suss	ex County, DE	Engineering Departi	ment		
Drilling comp	oany: John D. F	lynes & Assoc., Inc.		Date: 10-14-2016	
Method: hol	low-stem auger	and split spoon san	npling		
By: S. Mogili	nicki of WRA				
depth (ft.)			description		
0-2	Moist E	pun fine qu	uartz SAND	trace silt	
2-4	(san	18)			
4-6	(sa.	me)			
6-8	(San	1e)			
8-10	Moist	- From to.	gray fineto	omedium	
	Gerra	+tZ SAN	D		
10-12	WEt	light gray	fine quartz	- SAND	
	too	ce silt			
12-14	(50	ame)			
14-16	(5	ame)			
16-18	(50	ame)			
18-20	C	rame)			
			· 1		
•					
	•				
		<b>K</b>			
	=				
				A	
	nponent(s) in C		= 10 - 20%, trace = 1	- 10%	

Geologic La	og of Boring: $B-14$	Page of			
	Bays Regional Wastewater Facilities, Suss				
	Client: Sussex County, DE Engineering Department				
	pany: John D. Hynes & Assoc., Inc.	Date: 10-12-16			
	low-stem auger and split spoon sampling				
	nicki of WRA				
depth (ft.)	descr				
0-4	Moist brown fine quart	z SAND trace silt			
2-7	(same)				
4-6	(Same)	1- CAAIT			
6-8	Moist Drown tine qua	HZ SAND			
0 10	Little Sut	2 54/			
8-10	Moist light gray t	ine quarte SAND			
10 10	Trace SIUT	R I WILL CAND			
10-12	Wet trown to gray	fine to medium SAND			
1 1	trace sitt				
12-14	Wet brange-Drawn	fine to medium			
171 17	, quartz SAND				
14-16	(same)				
16-18	Wet orange- Drown	fire to medium			
10	quartz SAND Tra	ce silt			
18-20	Wet orange-prown	(trace black)			
	fine to medium	quartz SAND			
•					
	6.				
	ii.				
	nponent(s) in CAPITALS.				
Minor: and =	= 35 - 50%, some = 20 - 35%, little = 10 - 2	0%, trace = 1 - 10%.			

Geologic Lo	og of Boring: $B-15$	Page / of /
	Bays Regional Wastewater Facilities, Suss	
	ex County, DE Engineering Department	
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: 10-31-2016
Method; hol	low-stem auger and split spoon sampling	
By: S. Mogilr	nicki of WRA	
depth (ft.)	desc	ription
0-2		ct & SAND trace sitt
2-4	Dry light brown fine	quartz SAND
	Trace Silt	7 800 1 1 2 20 10 4 2
4-6	Moist light brown +	fine quart & SAND
	trace silt	
6-8	Moist light brown	to orange-brown
	fine to medium q	uartz SAND
8-10	Wet gray fine to	medium
· · · · · · · · · · · · · · · · · · ·	guartz SANI	frace silt
10-12	(same)	
12-14	(same)	
14-16	(same)	01
16-18	Wet gray to brow	n fine quartz SAND
10 -	trace sitt	
18-20	(No sample avail	able.)
•		
	•	
	10-0	
	<i>b.</i>	
Principal con	nponent(s) in CAPITALS.	
Minor: and =	= 35 - 50%, some = 20 - 35%, little = 10 -	20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $B-16$ Page / of /				
	Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware				
Client: Suss	sex County, DE Engineering Department				
Drilling comp	pany: John D. Hynes & Assoc., Inc. Date: 10-14-2016				
Method: hol	low-stem auger and split spoon sampling				
	nicki of WRA				
depth (ft.)	Moist brown fine quartz SAND trace silt				
2-14	(Some)				
2-7	(Same)				
7-0	distant				
0-0	Moist gray fine to medium quartz SAND Wet gray medium to coarse glartz SAND				
10 12	Wet gray wiew um 10 course guart & SAND				
10-12	Wet light gray fine quartz SAND				
12-14	Wet gray fire to medium quarte SAND				
111-16					
1/0-12	(same)				
18-20	(same)				
10-20	Wet gray medium to coarse quartz SAND trace subrounded quartz gravel				
	vace suprounated quartz graves				
	f.e.				
*					
	<i>b</i>				
Principal con	nponent(s) in CAPITALS.				
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%,				

Geologic Lo	og of Boring: $\mathcal{B}$ -	-17	Page / of /		
	Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware				
Client: Suss	ex County, DE Enginee	ring Department			
Drilling comp	oany: John D. Hynes &	Assoc., Inc.	Date: 9-16-2016		
Method: hol	low-stem auger and spl	t spoon sampling			
By: S. Mogil	nicki of WRA				
depth (ft.)		descript			
0-2	Dry Drown	fine quarta	* SAND trace silt		
2-4	(same	)			
4-6	Moist brown	on fine qua	te SAND trace sitt		
6-8	(Same	<u> </u>			
8-10	Moist brow.	n to gray	fine to medium		
10-12	Westerra	to brown	fine to Medium		
12	grant 2	SAND	The state of the s		
12-14	Wet brow	n and orang	ie-brown		
	mediun	1 to coarse	guarta SAND		
	trace	Subrounded	quartz grave		
14-16	(same)				
16-18	Wet orange	- brown fil	ne to Medium		
16	Guart Z	SAND tra	1 - 1		
18-20	Wet prai	co-brown t	me quartz SAND		
	little	silt			
•					
	*				
	*				
			*.		
			(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		
	nponent(s) in CAPITALS : 35 - 50%, some = 20 -		%, trace = 1 - 10%.		

0	P.	10	Dans / .f. /
	og of Boring: B—		Page / of /
			issex County, Delaware
	sex County, DE Engine pany: John D. Hynes &		Date: 10-14-2016
	low-stem auger and sp		
	nicki of WRA	ant spoon sampling	
	IICKI OI VVIVA		11
depth (ft.)	A A	de	scription
0-2	Moist brow	on the qua	tz SAND trace sit
2-4	(same)		
4-6	(Same)		
6-8	(Same	)	
8-10	gray 51		
10-12	gray	>1_/	maday + CAID
12-14	Wet gran	Tine To	medium quart = SAND
14-16	(Same		
10-10	(Same		
18-20	Garrie)		
			(***
9~			
	6.		
Dringing! par	ananant(a) in CARITAL	C	
	nponent(s) in CAPITAL = 35 - 50%, some = 20		- 20%, trace = 1 - 10%.

Geologic Lo	og of Boring:	B-19		Page / of /
		Wastewater Facilitie	s, Sussex County, D	
		Engineering Departr		
Drilling comp	oany: John D. F	lynes & Assoc., Inc.		Date: 10-14-2016
Method: hol	low-stem auger	and split spoon san	npling	
By: S. Mogili	nicki of WRA			
depth (ft.)			description	
0-2-	Moist &	rown fine gi	uartz SAN	D trace sitt
2-4	(sar	ne)		
4-6	(Sa	me)		
6-8	M0137	- gray fine	to medium	quartz SAND
	toa	ce silt		0
8-10	Wet I	prown to	your fine to	n medium
	qua	HZ SAN	D	
10-12	Wet	light gray	ting to m	edium
	quar	tz SAN	D trace &	it
12-14	CA	10 recovery		
14-16	Wet	light gray	y time qua	INTE SAND
11 10	1 1	He sitt	7 . 7	7
16-18	Wet	gray CTrac	e Drown	MIEI
18-20	INDA	OF SHAD	and OF	24.0
18-20	we	gray med	Dam to co	Gravel
	guar	TE SHO	U I TAGE	Jier-
<b>D</b> +				
		b.		
			. =	
D: : ,	1/ \ \ \ \ \ \	ADITALO		
Minor: and	mponent(s) in C/ = 35 - 50%, son	APITALS. ne = 20 - 35%,  little	= 10 - 20%, trace =	: 1 - 10%.

	_				
Geologic Lo	og of Boring: $B-20$	Page / of /			
Site: Inland	Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware				
Client: Suss	sex County, DE Engineering Department				
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: 10-14-2016			
Method: hol	low-stem auger and split spoon sampling				
By: S. Mogil	nicki of WRA	A			
depth (ft.)	de	scription			
0-2-	Moist brown fine que	rtz SAND trace silt			
2-4	(Same)				
4-6	Moist gray fine to mes	lium quartz SAND			
	trace silt				
6-8	(same)				
8-10	Moist light gray -	fine quartz SAND			
	trace silt				
10-12	Wet light gray to	ne quartz SAND			
	trace silt	the sun to SAA			
12-14	Not gray the to	Medium quartz SAND			
14-16	(same)				
10-18	(Same)	to anista a contra SAAD			
10-20	Net gray wearing	to course quartz SAND ed quartz gravel			
	trace 3ubround	ea quart & graves			
	, b				
+	- I I II II				
	<u> </u>				
		22 447			
	mponent(s) in CAPITALS.	20% trace = 1 10%			
iviinor: and :	= 35 - 50%, some = 20 - 35%, little = 10	- 20%, trace = 1 - 10%			

Geologic Lo	og of Boring:	B-21	Page / of /
		Wastewater Facilities,	Sussex County, Delaware
		Engineering Departme	
Drilling comp	oany: John D. F	lynes & Assoc., Inc.	Date: 10-14-2016
Method: hol	low-stem auger	and split spoon sampl	ng
By: S. Mogili	nicki of WRA		
depth (ft.)			description
0-2	Moist	brown fine ou	artz SAND trace silt
2-4	(sar	ne)	
4-6	(Sal	ne)	
6-8	Moist ligh	ht gray, brown	finequartz SAND
2-10	150	race SIVI	
10-12	Same	10)	
12-14	Wet 1	aht Grav +	ine quartz SAND
		little Sil	t
14-16	Wet 1	right gray	fine to medium
	que	arta SAN	D trace silt
16-18	Wet	gray med	ium to coarse
	- 91	uar 47 5	AND I
18-20	(săn	7e)	
		15 100	
*			
	*		
		<b>k</b>	
	nponent(s) in C/ = 35 - 50%, son		10 - 20%, trace = 1 - 10%

Geologic Lo	og of Boring:	B-22	Page / of /		
			Sussex County, Delaware		
	Client: Sussex County, DE Engineering Department				
Drilling comp	Drilling company: John D. Hynes & Assoc., Inc. Date: 10-14-2016				
Method: hol	low-stem auger ar	nd split spoon sampli	ng		
By: S. Mogili	nicki of WRA				
depth (ft.)			escription		
0-2	Moist:	brown fine	quartz SAND fonce silt		
2-4	(5	ame)			
4-6	(5	ame)			
6-8	Moist brow	on fine qua	rtz SAND trace silt		
8-10		same)			
10-12		(same)			
12-14	gray 5	ILT trace	clay		
14-16	grai	, SILT tra	ice clay		
16-18	Not gre	ay fine to	medium quartz SAND		
18-20	Wet pra	ngo-brown	fine to medium		
	quar	77 SAND			
			v. <sup>J</sup>		
•					
	*				
		6.			
	E.				
			is*		
	nponent(s) in CAP = 35 - 50%, some		0 - 20%, trace = 1 - 10%.		

Geologic Lo	ng of Boring:	B-2	3	Page / of /
				sex County, Delaware
	ex County, DE			
Drilling comp	oany: John D. I	lynes & Ass	oc., Inc.	Date: 10-14-2016
Method: hol	low-stem auger	and split sp	oon sampling	
By: S. Mogili	nicki of WRA			
depth (ft.)			desc	cription
0-2	Moist +	brown f	ine quar	tz SAND trace silt
2-4	(5	ame)	0	
4-6	(	same		
6-8	Moist	- Light	gray fi	ne quartz SAND
8-10	(San	ne)		
10-12	(50	me)		2
12-14	Net l	ght gra	y fine	to medium SAND
1	trai	ce sil	t	
14-16	wet	light 9	ray fin	e to medium
4.	9	wast Z	SAND	
16-18	Wetgra	y Strace	red) medi	um to Coarse
1/2 = 111	940	rtz	SAND	
18-20	Wet	light	gray 7	tine to medium
		quart	Z SA	N.D
		11 11		
	× ×			
				2, * 2
	nponent(s) in C = 35 - 50%, sor		%, little = 10 -	20%, trace = 1 - 10%.

Geologic Lo	og of Boring:	B-24		Page / of /
		Wastewater Facilities	. Sussex County, De	/ /
		Engineering Departm		
		lynes & Assoc., Inc.		Date: 10-14-2016
		and split spoon samp	oling	
	nicki of WRA			
			docarintian	
depth (ft.)	Moist.	1 Lino	guartz SA	ND trace sitt
2-4	1010131	prown line	quariz Sisi	V P Trace Sive
4-6		sume)		
10-0		(Same)		
8-10	Mais	+ Isht b	DWN fine	to medium
0 10	0110	1++ CAA	No.	The state of the s
10-12	alan	SILT +	race class	
12-14	July	(samo)	The state of the s	
14-16	LI.	(Samo)		- A D
16-18	West	gray Hi	ne to medi	um
70 . 0		guart Z	SAND	
18-20	(Sa	(me)		
			3 4000	
		k		
	-			
				30
		<u></u>		
Principal con	nponent(s) in CA	APITALS		
		ne = 20 - 35%, little =	10 - 20%, trace =	1 - 10%

Geologic Lo	og of Boring: B-25 Page / of /					
	Bays Regional Wastewater Facilities, Sussex County, Delaware					
	sex County, DE Engineering Department					
	Drilling company: John D. Hynes & Assoc., Inc.  Date: 10-12-2016					
	llow-stem auger and split spoon sampling					
	nicki of WRA					
depth (ft.)	description					
0-2	Moist brown fine quartz SAND trace sitt					
2-4	Moist brown fine quartz SAND trace silt					
	trace black organic matter					
4-6	Moist Drown to gray fine to medium					
	quarte SAND trace silt					
6-8	Moist brownish gray fine to medium					
	quartz SAND trace sitt					
8-10	(same)					
10-12	Moist light gray the quartz SAND					
12-14	Net gray medium to coarse					
/ / / / /	guartz SAND					
14-16	Wet gray fine quarte SHND					
16-10	trace Silt					
10-18	(Same)					
18-20	(zame)					
	*					
	\$					
	ar a					
	nponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.					

Geologic Lo	g of Boring:	B-26	Page / of /
			ussex County, Delaware
Client: Suss	ex County, DE	Engineering Departmen	
Drilling comp	oany: John D. F	lynes & Assoc., Inc.	Date: 10-12-2016
Method: hol	low-stem auger	and split spoon sampling	g
By: S. Mogilr	nicki of WRA		**************************************
depth (ft.)		de	escription
0-2	Moist		guarta SAND
		trace sitt	
2-4	Moist	brown fine T	o medium quarta SAND
4-6	(Sur	ne)	ν
6-8	Moist	gray tine	to medium quartz SAND
	tra	ce Black &	ganic matter
8-10	Wet 9	ray mediu	in to coarse
	ge	artt, SAI	D trace subrounded
	10	gravel	
10-12	San	re)	
12-14	VVET	gray mean	um to coarse
11 1/	111068	Wart & DA	MD
14-16	Wet	gray (trace	brown black) time to medium
16-10	que	CCC TO STATE	1
18-20	900	CIAV	
10-20	Jiv	7 (1)	
		×	
•		W	
	•		
		<b>b</b>	
	- 11		
Principal con	nponent(s) in C	APITALS	
			) - 20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $B-27$ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
Drilling comp	pany: John D. Hynes & Assoc., Inc. Date: 10-12-2016
Method: hol	llow-stem auger and split spoon sampling
By: S. Mogil	nicki of WRA
depth (ft.)	description
0-2	Moist Drown finequart & SAND trace sitt
2-4	(same)
4-6	(same)
6-8	Moist Brownish-gray fine quarta SAND trace silt
	trace silt
8-10	(same)
10-12	Wet Drownish-gray fine SAND
10 111	trace silt
62-14	(Same)
14-16	(Same)
10-18	(Same)
10-20	(Same)
	8K.,
*	
	•
	N.
Principal con	nponent(s) in CAPITALS.
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Geologic L	og of Boring: B-28 Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	ex County, DE Engineering Department
	pany: John D. Hynes & Assoc., Inc. Date: 10-12-14
	low-stem auger and split spoon sampling
	nicki of WRA
depth (ft.)	description
0-2	Moist brown fine to medium quart & SAND
	trace silt
2-4	Moist orange-brown fine to medium
	quartz SAND trace sitt
4-6	(same)
6-8	Wet orange- prown medium to coarse
	quarta SAND
8-10	(Same)
10-12	(same)
12-14	Wet light gray (trace red, black, white)
	fine to medium quartz SAND
14-16	(Same)
16-18	Wet gray (trace black, white, red)
	Medium to course quarte SAND
	trace subrounded to subangular
160	gravel
18-20	(Same)
<b>6</b> -	
	•
	w. H
Principal con	nponent(s) in CAPITALS.
ivilnor: and =	35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%

Geologic Lo	og of Boring:	B-29	Page / of /
			issex County, Delaware
		ngineering Department	19992AV
		nes & Assoc., Inc.	Date: 10-12-2016
Method: hol	low-stem auger a	nd split spoon sampling	
By: S. Mogili	nicki of WRA		
depth (ft.)		de	scription
0-2	Moist	mwn fine a	uarta SAND trace sitt
2-4	(san	ie)	
4-6	(50	me)	
6-8	Wet o	range-brown	1 fine quartz SAND
8-10	(sai	ne	
10-12	wet i	light brown	n fine to medium
	qua.	42 SAN	
12-14	(5	ame)	
14-16	Wet	light gray	fine quartz SAND
77	trace	sitt	
16-18	Wet g	ray (Trace	black, white, rea)
	fine 7	o medium	704172
10 0 -	trac	e Subroune	led gravel
18-20	(Sa	me)	
<b>\$</b> -			
		<b>A</b>	WK
			, and
	nponent(s) in CAF = 35 - 50%, some		- 20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $B-30$ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
	pany: John D. Hynes & Assoc., Inc. Date: /0-12-2016
	low-stem auger and split spoon sampling
	nicki of WRA
depth (ft.)	description
0-2	Moist brown fine quartz SAND trace sitt
2-4	(same)
4-6	Moist Brown fine to medium
	quarta SAND
6-8	Wet light gray fine to medium
	quartz SAND, trace
	Subangular to subrounded grave
8-10	(same)
10-12	(same)
12-14	(same)
14-16	Wet brown fine to medium guartz SAND
	trace subrounded gravel
16-18	Wet orange- brown madium to course
*	quart 7 SAND
18-20	Wet orange-brown (trace red)
	medium to coarse quart & SAND
•	
	<b>b</b>
	.*
	•
Principal con	mponent(s) in CAPITALS.
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Caalcaia	an of Davings MM/-1 Page 1 of 1
	og of Boring: MW-/ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
	pany: Geomatrix Date: 10-23-2015
	llow-stem auger and split spoon sampling (drilled 12-11-2014)
By: S. Mogil	nicki of WRA
depth (ft.)	description
0-2	brown fine quart & SAND, trace silt
2-4	(same)
4-6	light brown fine quartz SAND, trace silt
6-8	(3/1/2)
8-10	gravish white (trace black) fine quartz
	grayish white (trace black) fine quartz
10-12	(same)
12-14	(same)
14-16	light brown (trace black) fine to medium
	GUARTZ SAND
16-18	light brown fine to medium quartz SAND
	that a second se
18-20	orange-brown fine to medium quartz SAND yellowish brown SILT little fine sand orange-brown fine quartz SAND
20-22	yellowish brown SILT little fine sand
22-24	orange-brown fine quartz SAND
	trace silt
24-26	(same)
26-28	orange-brown fine to Madium quartz SANI
28-30	(same)
30-32	light brown fine to medium quart & SAND
	trace Subangular to Subrounded grave
32-34	Drange-brown fine quart & SAND
34-36	light brown tine to medium quarte SAND
36-38	orange-brown SILT trace time sand
38-40	(Same)
Dringing	manant(a) in CARITALS
	mponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.
міног, апа	- 55 - 50 /o, Sume - 20 - 55 /o, mile - 10 - 20 /o, made - 1 - 10 /o.

	1111	/ +
Geologic L	og of Boring: MW-2	Page / of /
Site: Inland	Bays Regional Wastewater Facilities, Sussex	County, Delaware
Client: Suss	sex County, DE Engineering Department	
Drilling com	pany: Geomatrix	Date: 10-13-2015
Method: ho	llow-stem auger and split spoon sampling	(drilled 12-11-2014)
By: S. Mogil	nicki of WRA	
depth (ft.)	descripti	ion
0-2	brown fine to medium	
2-4	brown fine to medium	CUE+2 SAND
2-7	little silt	GONTIE STIVE
4-6	brown fine to medium	Sucrta SAND
7-6	trace gravel	our it silves
6-8	light grow fine qua	to CAND trace silt
0 10	right girls the guar	Z SHIVD, CINCE SILL
8-10	(same) (same)	
10-12	(same)	
12-17	(same)	<u> </u>
17-16	(same)	
18-20		redium quartz SAND
		taring from 1 1 1100
20-22	(Sanie)	
24-26	(same)	
26-28	(Sa Wie)	
28-30	(same)	
20-32	(same)	
32-34	(Same)	
34-36	light gray Etrace ble	ack fine to medium
04.50	guartz SAN	
36-38		
38-40	(same)	
36-70	(same)	
		112 11- 2- 2- 12 - 210 - 210 - 210 - 12 - 12
	·	
		1.5 4 1111 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1
	for the state of t	
	B	101100000000000000000000000000000000000
		7-
Principal con	nponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%	%, trace = 1 - 10%.

	og of Boring: MW-3 Page / of / Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
	pany: Geomatrix Date: 10-23-201
	llow-stem auger and split spoon sampling (drilled 12-11-20)
by. S. Mogli	Inicki of WRA
depth (ft.)	description
0-2	light brown fine quarte SAND trace silt
2-4	
4-6	light brown fine quartz SAND trace Silt
	trace silt
6-8	(same)
8-10	orange-brown fine quart & SAND
0	trace Sist
10-12	light brown fine quart & SAND
1	trace silt
12-14	(same)
14-16	orange-bown fine to medium guart 2 SANI
16-18	light brown fine quartz SAND
10 10	trace silt
18-20	army medium to coarse curret & SAND
20-22	gray medium to coarse quartz SAND brown to gray fine to medium quartz SAND
22-24	am froto medium and to the
~	gray fine to medium quarte SAND Some silt
24-26	gray fine to medium quartz SAND
26-28	(same)
28-3Q	(same)
20-22	army fine to medium quarta SAND
30 35	trace submunded a sure!
32-34	and fine to medium quarte SAND
211-26	army fine to medium quarte SAND
74 50	trace Suprounded accused
26-20	tract con for quarte SAAID
0000	light gray the That's I'm
20 40	Carred SIXT
38-40	(Same)
	42/
	The state of the s
	mponent(s) in CAPITALS.

Geologic Lo	og of Boring: $MW-7$ Page / of /
Site: Inland	Bays Regional Wastewater Facilities, Sussex County, Delaware
Client: Suss	sex County, DE Engineering Department
Drilling comp	pany: Geomatrix Date: 10-23-2015
	low-stem auger and split spoon sampling (drilled 12-8-2014
	nicki of WRA
	description
depth (ft.)	that BILT and SAND a me page mic matter
0-2	black SILT and SAND some organic matter brown fine to medium quartz SAND
2-4	Drown Tine to Meatum quart & SANG
4-6	(same)
6-8	(Same)
8-10	gray fine quartz SAND trace silt
10-12	(same)
12-14	(same)
14-16	(same)
16-18	(same)
18-20	(same)
20-22	(same)
22-24	(same)
24-26	(same)
26-28	(Same)
28-30	(same)
30-32	(same)
32-34	gray fine to medium gyartz SAND
21121	trace grantz gravel
34-36	gray fine to medium quart & SAND
36-38	(Same)
38-40	gray tine to medium quarte SHND
	gray fine to medium quartz SAND trace gravel
-117-11-11-11-11-11-11-11-11-11-11-11-11	
•	nponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Coologic Lo	g of Boring: MW-8	Page / of /
	Bays Regional Wastewater Facilities, Suss	
	ex County, DE Engineering Department	ex County, Delaware
		Dato: 10.22-2015
	any: Geomatrix	Date: 10-23-2015
	ow-stem auger and split spoon sampling	(drilled 12-10-2014)
By: S. Mogiln	ICKI OT VVRA	
depth (ft.)	descr	iption
0-2	brown fine to mediu.	m quartz SAND
2-4	(same)	
4-6	(same)	
6-8	(same)	
8-10	(same)	
10-12	brown to gray fi	ne to medium
	guarta SA	ND
12-14	(same)	
14-16	(same)	
16-18	gray fine to me	dium quartz SAND
18-20	(same)	0
20-22	(same)	
22-24	(same)	32
24-26	(same)	
26-28	(same)	
28-30	gray fine quartz	SAND trace Sibt
30-32	(same)	
32-34	(Same)	
34-36	(same)	
34-38	gray fine to medica	m quartz SAND
38-40	(Same)	7
20		
	\$	
	8	
		e 5
		·
Principal com	ponent(s) in CAPITALS.	
Minor: and =	35 - 50%, some = 20 - 35%, little = 10 - 2	0%, trace = 1 - 10%.

Geologic Log of Boring: MW-9 Page / of /
Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware
Client: Sussex County, DE Engineering Department
Drilling company: Greenatrix Date: 10-23-2015
Method: hollow-stem auger and split spoon sampling (dri/led/12-10-2014)
By: S. Mogilnicki of WRA
depth (ft.) description
0-2 brown fine to medium quartz SAND
2-4 (same)
4-6 (same)
6-8 From to gray fine to medium
quarta SAND
8-10 (same)
10-12 (same)
12-14 (samé)
14-16 Drown SIET Some Clay
16-18 grave CLAY trace silt
18-20 gray CLAY trace sitt
20-22 From CLAY trace silt
22-24 orange- frown fine to medium
quartz SAND
24-26 (same)
26-28 gray fine quartz SAND trace silt
28-30 (same)
30-32 (Same)
32-34 (Same)
34-36. (same)
36-38 (Same)
38-40 gray fine to medium quartz SAND trace subrounded quartz gravel
trace Subrounded quart = gravel
District CARITAL C
Principal component(s) in CAPITALS.  Minor: and = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $MW-12$	Page / of /
	Bays Regional Wastewater Facilities, S	<u> </u>
	sex County, DE Engineering Departmen	
	pany: John D. Hynes & Assoc., Inc.	Date: 10-12-2016
	low-stem auger and split spoon sampli	
	nicki of WRA	<u> </u>
depth (ft.)	Moist brown fine to m	escription edum quartz SAAID
0-1-	trace Silt	earum quart = TIMB
2-4	Trace 314	
14-1-	Same	
1 0	West about to be	own fine to medium
6-0	med gray to Si	AND
8-10	(same)	
10-17	(Same)	
12-14	Wet gray Fino	to medium quart 7 SAND
14-16	Wet army Strace	
	fine to mea	lium quarta SAND
16-18	(same)	
18-20	(same)	- 1×2°
10		
	10 10 10 10 10 10 10 10 10 10 10 10 10 1	
	····	
9-		
	<u>k</u>	
	II TO THE HEATT THE	4.5°
Principal con	nponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little = 1	0 - 20% trace = 1 - 10%

Geologic Lo	og of Boring: $MW-13$ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	ex County, DE Engineering Department
Drilling comp	pany: John D. Hynes & Assoc., Inc. Date: 10-12-2016
Method: hol	low-stem auger and split spoon sampling
By: S. Mogili	nicki of WRA
depth (ft.)	description
0-2	Moist brown SAND trace silt
2-4	(same)
14-1-	(same)
10-8	Wet gray fine to medium quarte SAND
8-10	(Same)
10-12	(same)
12-14	(same)
14-16	Wet prange-brown fine to medium
7-4-10	QUEST = SAND
16-18	West gray fine to medium quart & SAND
18-20	Wet gray fine to medium quart & SAND, wet gray fine to medium SAND,
	Frace subrounded quartz gravel
	,0 20
•	
	<u>k.</u>
Dein air al a co	an anant/a) in CADITALS
	nponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

		1111/ 111	, ,
	og of Boring:		Page / of /
		Wastewater Facilities, Su	issex County, Delaware
Client: Suss	sex County, DE	Engineering Department	
Drilling comp	oany: John D. F	lynes & Assoc., Inc.	Date: 9-28-2016
Method: hol	low-stem auger	and split spoon sampling	]
By: S. Mogili	nicki of WRA	5	
depth (ft.)		de	scription
0-2	Moist to		rtz SAND trace silt
2-4		me)	
4-10	Moista	,	- brown fine
	allar	FI SAND	little silt
6-8	Druli	ant brown to	orange-brown
	fine	2 Quartz St	
8-10	Wet 1	ight brown.	^
10-12	wet a	ran fine ge	
	lif-	tle sitt	
12-14	Wetgi	my to orange.	- brown
		ne to medium	
14-16			orange- brown
	fine	quartz SAI	ND Little sitt
16-18	Wet a	range- brown	medium to coarse
	quart		ace subangular to
	Subr	ounded grav	el consisting of
	qu		ray rock
18-20	(Sav	ne)	9
		, ,	
-			
			*
	*		
		8	
	g g		
	nponent(s) in CA		
Minor: and =	= 35 - 50%, son	ne = 20 - 35%, little = 10	- 20%, trace = 1 - 10%

Geologic Lo	og of Boring: MW-15	Page / of /
	Bays Regional Wastewater Facilities, Sussex	
	sex County, DE Engineering Department	
Drilling com	pany: John D. Hynes & Assoc., Inc.	Date: 9-27-2016
	llow-stem auger and split spoon sampling	
By: S. Mogil	nicki of WRA	
depth (ft.)	descrip	
0-2	Moist gray fine quartz	SAND trace silt
2-4	(same)	
4-6	Moist light brown to	
,	fine to medium St	ND trace Silt
6-8	(same)	
8-10	Moist prange-brown	togray
	fine quart 7 SANI	Some sitt
10-12	Wet glay (trace red,	white, black
	medium to cours	
12-14	Wet light brown ,	Cité quart 2 SAND
	trace sitt	
14-16	Wet light brown +	o orange-brown
	medium to coarse	
	trace clear gubrou.	
16-18		o orange-brown
		nedium to coarse
	quartz SAND trac	ce subrounded
	quartz grave	
18-20	Wet orange-brown	medium to Coarse
	quart = SAND, Ith	le subrounded to
	Subangular grave	
		K.
	mponent(s) in CAPITALS. = 35 - 50%,  some = 20 - 35%,  little = 10 - 20	%, trace = 1 - 10%.

Geologic I c	og of Boring: MW-16 Page / of /
Site: Inland	Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
	pany: John D. Hynes & Assoc., Inc. Date: 9-27-2016
	low-stem auger and split spoon sampling
By: S. Mogilr	IICKI OI VVRA
depth (ft.)	description
0-2	Moist brown fine quarte SAND trace sitt
2-4	(same)
4-6	(same)
6-8	Moist brown fine quarte SAND
	little silt
8-10	Moist light brown fine quarty SAND
	trace silt
10-12	Dry gray to orange-brown (SILT)
-	little clay-
12-14	Moist gray to Brange-brown SILT
	Little clay
14-16	Moist gray to prance-brown SILT
16-18	
10 10	fine to medium quart & SAND trace silt
	trace silt
18-20	(same)
20-2-2	Wet light brown fine to medium
20-24	CHARTS SAND
22-24	Wet prange-brown (traceblack, white)
02 21	fine to medium quartz SAND
24-2%	(same)
- 1 2-10	· (Same)
	•
1	
Dain -in- a b -	manant/a) in CADITALS
	nponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Geologic L	og of Boring:	MW-	17		Page / of /
Site: Inland	Bays Regional	Wastewater	Facilities. S	ussex Coun	
	sex County, DE				-
	pany: John D. H				Date: 9-28-2016
	llow-stem auger	***************************************		g	
	nicki of WRA				
depth (ft.)			de	scription	
0-2	Moist 1	Srown .	fine go	eart Z	SAND trace silt
2-4	(sa	me)	0		
4-6	(3	same)			
6-8	Moist	Right	promo	, fine	quartz SAND
8-10	(50	une)			
10-12			- brow	SANT	gray B trace silt
12-14	Dollar		fine	Guart	= SAND
12-11	Ury	frace	SIA	funi	
14-16	MoisT	+ gray	SILT	trace	2 Class
		0 01	SILT on tap o	f)	
	orana	e-bro	won fi	réton	redium quartz SAND
16-18	Wet	light	gray	trace	black, white, red)
	fine	to n	edium	quar	te SAND
	ti		1100		
18-20	Wet a	range.	- brow	n, gra	artz SAND
2	medin	m to	coarse	- qui	irtz SAND
20-22		(same			Ent mali
22-24	Wet		-21	WM 7	fine to medium
24-21	90		10	VID	
24-76		(Sarr	ie)		
-					
	11				
					# #25
	mponent(s) in C		.0/ 1:11 ~ 4.0	200/ 4	00 = 1 100/
Invitrior: and	= 35 - 50%, sor	ne – 20 <b>-</b> 35	70, IILLE = T	7 - 20%, lfa	CE - 1 - 1070.

Geologic Lo	og of Boring: MW— 18	Page / of /
	Bays Regional Wastewater Facilities, Sussex Cour	
	sex County, DE Engineering Department	
	pany: John D. Hynes & Assoc., Inc.	Date: 9-27-2016
	llow-stem auger and split spoon sampling	
By: S. Mogili	nicki of WRA	
depth (ft.)	description	
0-2	Moist brown fine SAND	trace sitt
2-4	(same)	
4-6	(camo)	
6-8	Dry light brown fine	guartz SAND guartz SAND
8-10	Dry hight gray fine	quartz SAND
10-12	(30M2)	
12-14	Moist gray fine que	art & SAND
	trace sitt	
14-16	Wet light brown to gra	ay fine quartz
	SAND trace silt	_ ′
16-18	Wet orange-brown fi	ne to medium
10	quartz SAND tra	ce silt
18-20	Wet light brown (tra	ree black)
	fine quartz SAND	little sitt
20-22	(same)	
		TIND 1-10-1-10-10-10-10-10-10-10-10-10-10-10-
		(4
Principal com	nponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, tra	ce = 1 - 10%.

Geologic Lo	og of Boring: $MW-19$	Page / of /
	Bays Regional Wastewater Facilities, Su	<u> </u>
	sex County, DE Engineering Department	
	pany: John D. Hynes & Assoc., Inc.	Date: 9-23-2016
	llow-stem auger and split spoon sampling	
	nicki of WRA	
depth (ft.)		scription
0-2	Moist brown fine quart	
2-4	(same)	
4-6	(same)	
6-8	(same)	
8-10	(Same)	~
10-12	Dry light brown	fine quartz SAND
	little silt	
12-14	Moist Drange- by	own fine to medium
•	quarta SAN	
14-16	Wet prange-brow	un fine to medium
	augusta SAND	trace Suprounded
	D quart 7 grave	
16-18	Wet orang -brown	to light brown
	medium to coar	se quartz SAND
	trace subround	
18-20	(same)	
20-22	(same)	7
22-24	Wet light brown	fine to medium
	quarty SA	ND
	0	
		1
	k.	
	(F	
2		
	mponent(s) in CAPITALS. = 35 - 50%, some = 20 - 35%, little = 10	- 20%, trace = 1 - 10%.

Geologic L	og of Boring: $MW - 20$	Page / of /
Site: Inland	Bays Regional Wastewater Facilities, Suss	ex County, Delaware
Client: Suss	sex County, DE Engineering Department	-
Drilling com	pany: John D. Hynes & Assoc., Inc.	Date: 10-12 -2016
Method: ho	llow-stem auger and split spoon sampling	
By: S. Mogil	nicki of WRA	
depth (ft.)	descr	iption
0-2	Moist light brown fine go	
2-4	(Same)	
4-6	(Same)	
6-8	Wet light gray fine	quartz SAND
8-10	Wet gray to prowi	
400	time to medium	914
10-12		(trace white, black)
	fine to medicin	quarte SAND
12-14	trace subrounded	white quartz gavel
14-16	(Samo)	Christa walla : aal
14-16	Wet light brown	. 3/
	black) medium	trace Subrounded
	quart 7 grave	
16-18	Wet light proun	finetomedium
100		trace black organic matter
18-20	Wet light brown	
	Trace Silt	
+		
	•	
	h	
		ar <sup>a</sup>
	VAL CARITAL C	
Principal con   Minor: and =	nponent(s) in CAPITALS. = 35 - 50%,  some = 20 - 35%,  little = 10 - 2	0%, trace = 1 - 10%.

Geologic Lo	og of Boring: $MW-21$	Page / of /
	Bays Regional Wastewater Facilities,	
	sex County, DE Engineering Departme	
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: 9-15-2016
Method: hol	llow-stem auger and split spoon samp	
By: S. Mogili	nicki of WRA	
depth (ft.)		description
0-2	Dry light brown Y	Gine quartz SAND
	trace sitt	U
2-4	(same)	
4-6	Moist light brow	on fine quartz SAND
		Trace quartz gravel
6-8	Moist light brow	on to grass
	fine quartz:	SAND, trace sitt
	trace grave	
8-10	Moist light	STOWN fine quarta SAND
	trace silt	0
10-12	Wet light gray	fine to medium
	quart & SAKI	D trace silt
12-14	(same)	
14-16	Wet light gray	to light brown
	tine quarty	SAND' Hace Silt
16-18	Wet light gray	frace red, black,
	white) fine	to medium
	quartz SAT	10
18-20	(Same)	
		#1
	<del></del>	
	<u> </u>	
Dringing con	nponent(s) in CAPITALS.	
	= 35 - 50%, some = 20 - 35%, little =	10 - 20%, trace = 1 - 10%.

Geologic Lo	og of Boring: $MW-22$	Page / of
Site: Inland	Bays Regional Wastewater Facilities, Sussex C	ounty, Delaware
	sex County, DE Engineering Department	
	pany: John D. Hynes & Assoc., Inc.	Date: 9-23-
	low-stem auger and split spoon sampling	
By: S. Mogil	nicki of WRA	
depth (ft.)	description	1
0-2		-TZ SAND
	trace silt	
2-4	(same)	
4-6	(same)	
6-8	Moist light brown	fine quart & St
	trace silt	
8-10	(same)	
10-12	Wet light brown fr.	neguarta SA
	trace silt	0
12-14	Wet light gray fin	e quartz SA
	trace Subrounde	of gravel
14-16	(same)	
16-18	Wet light gray med	iroin to coars
	quarte SAND	× ×
18-20	Wet light gray (to	ace red black, W
	medium to coarse	quartz 5A.
•		
	k.	The state of the s

Geologic Lo	og of Boring: $MW-23$ Page / of /
	Bays Regional Wastewater Facilities, Sussex County, Delaware
	sex County, DE Engineering Department
	pany: John D. Hynes & Assoc., Inc. Date: 9-16-2016
	low-stem auger and split spoon sampling
By: S. Mogili	nicki of WRA
depth (ft.)	description
0- 7	
Va	Dry brown fine quartz SAND Wace silt
2-4	(came)
4-6	Dry trous to light brown
7 4	fine quart & SAND, trace silt
7 - 1-8	trace black organic matter
6-8	Moist white (some brown)
V-0	fine quartz SAND trace silt
8-10	Moist parais to prance- brown
	fine quartz SAND. little silt
10-12	Moist gray to brown fine quart & SAND
· .	from 10 to 11 Feet, on top of:
	Wet white fine to medition questo SAND
	from 11 to 12 feet
12-14	Wet light gray (trace red, white black)
	fine to medicin quart & SAND
14-16	Wet light gray (trace red, white, black)
	fine to medium quartz SAND
	trace Subangular black and
-/-	clear gravel
16-18	Wet light gray (trace red, white black)
10 1	medium to coarse quarte SAND
18-20	(same)
	L
	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·
Principal con	nponent(s) in CAPITALS.
	= 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Site: Inland	Bays Regional Wastewater Facilities, Sussex C	ounty, Delaware
Client: Suss	ex County, DE Engineering Department	
Drilling comp	pany: John D. Hynes & Assoc., Inc.	Date: 9-15 -
Method: hol	low-stem auger and split spoon sampling	•
By: S. Mogilr	nicki of WRA	
depth (ft.)	description	1
0-2		
	Dry brown fine quartz	
2-4	(same)	
4-6	Dry brown fine quar	ta SAND
1	trace silt	
10-8	(Same)	
0-10	Moist brown to gray	Enequarta SA
0-10	trace silt, trace su	bounded
	quart = gravel	Divinged
10-12	(Same)	
12-14	Moist to wet ligh	+ brown
''	fine quart 2 SAND	trace silt
14-16	Wet light trown f.	ne quarta SA
1 , 2	Some silt trace	Clary Clary
16-18	Wet gray Ctrace rea	black white
	fine quart = SA	1 1
12-20	Wet gray fine to m.	,
10	Quartz SAND	
	trace Subrounded Go	uartz gravel
	The state of the s	Jim of
•		
	k.	
	70	

Geologic Log of Boring: MW-25 Page / of /
Site: Inland Bays Regional Wastewater Facilities, Sussex County, Delaware
Client: Sussex County, DE Engineering Department
Drilling company: John D. Hynes & Assoc., Inc. Date: 9-16-2016
Method: hollow-stem auger and split spoon sampling
By: S. Mogilnicki of WRA
depth (ft.)
0-2 Moist brown fine quartz SAND
trace silt
2-4 (Same)
4-6 (same)
6-8 (same)
8-10 Moist light gray fine quartz SAND
trace silt
10-12 Moist to wet gray fine quartz SAND
trace silt
12-14 Wet light gray fine to medium
guartz SAND
trace subrounded quartz gravel
14-16 (Same)
16-18 Wet light gray to brown (trace red) medium to coarse quart & SAND
medilin to coarse quart & SAND
18-20 (same) quartz gravel
18-20 (Surie)
A
Principal component(s) in CAPITALS.  Minor: and = 35 - 50%, some = 20 - 35%, little = 10 - 20%, trace = 1 - 10%.

Geologic L	og of Boring: M	W-2	6	Page / of /
	Bays Regional Wastev			
	sex County, DE Engine			*
	pany: John D. Hynes 8			Date: 9-15-2016
	low-stem auger and sp			
	nicki of WRA	E1		
depth (ft.)			descri	ption
0-2	Dry light t	minn	FIRE	guarta SAND
- 1.00	tra	CP 5	ilit	guartz SAND
2-4	(50 m	0		
4-6	Dry bran	10-b	rown	fine quartz SAND
7	truce	5100	,	· ·
6-8	Moist ora	rige- 2	brown	fine quartz SAND
	trace	SIL	t	
8-10	(San	ne)		
10-12	(same	2)		
12-14	Moist	light	gran	, fine quartz SAND
	trace :	silt	0	
14-16	Wet gray	to b	nown	fine guestz SAND
	trace	Sil	t	
16-18	Wet pro	un to	gra	y fine quart & SAND
	Some	silt	, 17	ace Clay
18-20	(san	ne)		
20-22	Wet pro	un to	gray	tinequartz SAND
5 514	trace	silt	0	V
22-24	(Same)		7 *	
24-26	Wet gr	cy t	The T	medium trace silt
	quart.	2 5	AND	Trace SICT
	<i>V</i>			
		()-		
	L			
				<del></del>
	11			
				μ
Principal cor	nponent(s) in CAPITAL	S.		
	= 35 - 50% some $= 20$		le = 10 - 20	0% trace = 1 - 10%

#### Appendix 2 Grain Size Data



Geotechnical and Environmental Consultants Monitoring Well Installation Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8"	1/2"	3/4"	=	1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	16.9			44.6	66.1	81.0	93.3	98.9	99.8	100	,								6	4	B-1/S3
	10.9			12.7	. 17.9	30.0	55.5	94.8	97.0	97.9	99.2	100							16	14	B-2/S8
	18.3			28.9	64.7	85.2	97.6	99.5	99.8	99.9	100								12	10	B-3/S6
	28.1	16	39															Percent	16	14	B-3/S8
	9.5			14.4	26.9	47.0	73.4	92.1	98.9	99.9	100							Percent Passing	18	16	B-3/S9
	15.8			50.1	69.9	87.0	93.0	97.8	99.8	100									8	6	B-4/S4
	23.0	18	40																12	10	B-4/S6
	22.1			10.2	15.0	28.5	84.9	99.5	99.9	100											B-4/S9



Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/811	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	20.7			12.0	27.8	65.7	70.2	97.2	99.3	100									14	12	B-5/S7
	11.7	16	36																8	6	B-6/S4
	21.3			8.1	14.6	33.6	71.2	91.4	97.3	98.6	100								18	16	B-6/S9
	3.6			4.1	15.1	41.7	79.3	96.0	99.8	100								Percent	4	2	B-7/S2
,	19.2			8.3	12.7	25.0	56.0	89.6	98.7	100								Percent Passing	18	16	B-7/S9
	26.5			12.4	26.5	86.3	99.1	99.8	100										18	16	B-8/S9
	27.2	26	52																20	18	B-8/S10
	5.1			25.3	36.0	52.1	72.2	93.1	98.2	99.1	100								4	2	B-9/S2



Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8"	1/2"	3/4"	,	1 1/2"	2"	2 ½"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	17.5			12.5	17.3	30.7	52.3	92.3	97.2	100									10	8	B-10/S5
	19.8			5.9	10.2	23.7	56.9	90.6	99.1	99.9	100								16	14	B-11/S8
	17.5			13.2	19.3	30.6	59.5	92.2	99.4	100									10	8	B-12/S5
	25.5			18.3	30.3	67.4	93.2	99.6	100									Percent Passing	12	10	B-13/S6
	20.5			11.8	16.8	73.2	73.2	96.5	99.9	100								Passing	18	16	B-14/S9
	19.9			13.0	20.5	40.7	66.0	88.1	96.1	98.2	100								10	8	B-15/S5
	25.5			11.5	17.1	42.8	85.2	94.1	99.1	99.4	100								16	14	B-15/S8
	20.0			12.5	17.9	33.1	61.2	90.1	98.7	99.9	100								10	8	B-16/S5



Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Boring No./Sample No.	B-16/S7	B-17/S6	B-18/S5	B-18/S8	B-19/S6	B-19/S9	B-20/S7	B-21/S7
Begin Depth (ft.)	12	10	8	14	10	16	12	12
End Depth (ft.)	14	12	10	16	12	18	14	14
Sieve Size				Percent Passing	Passing			
2 1/2"								
2"								
1 1/2"								
3/4"						100		
1/2"						97.8		
3/8"					100	97.8	100	
No. 4	100			100	98.9	94.2	99.5	100
No. 10	99.6	100		99.7	97.6	77.9	98.9	99.8
No. 20	96.4	99.6		97.2	88.6	52.6	87.0	97.8
No. 40	64.0	96.4		73.3	53.6	26.7	37.5	2.88
No. 60	22.2	97.0		38.6	23.4	14.1	18.7	78.8
No. 100	10.6	26.1		15.0	13.6	7.9	10.9	41.3
No. 200	7.0	16.7		7.0	9.5	5.2	7.6	25.8
Liquid Limit			41					
Plasticity Index			17					
Natural Moisture %	26.0	30.3	21.6	19.4	19.5	12.8	25.4	26.1
Dry Unit Weight (pcf)						THE PARTY OF THE P		



Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

Dry I Init Weight (nof)	Natural Moisture % 21.1	Plasticity Index	Liquid Limit	No. 200 82.3	No. 100 92.0	No. 60 96.8	No. 40 99.2	No. 20 99.8	No. 10 99.9	No. 4 99.9	3%" 100	1/2"	3/4"	)—1 =	1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.) 14	Begin Depth (ft.) 12	Boring No./Sample No. B-22/S7
	3.5			1.9	4.5	23.0	67.1	98.0	99.9	100									6	4	B-23/S3
	22.4			10.8	14.7	26.4	61.2	94.4	99.5	100									14	12	B-23/S7
	22.0			65.4	79.9	92.1	97.9	99.2	99.6	99.9	100							Percent Passing	14	12	B-24/S7
	23.8			17.7	21.4	41.9	94.7	99.3	99.7	100								Passing	16	14	B-25/S8
	25.9			78.6	83.1	88.3	93.3	97.1	98.1	99.7	100								20	18	B-26/S10
	32.0		And the second s	8.5	13.5	58.3	98.9	99.9	100								The state of the s		14	12	B-27/S7
	8.6			8.6	11.4	22.9	56.1	89.5	97.3	99.7	100								6	4	B-28/S3



Geotechnical and Environmental Consultants Monitoring Well Installation Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8 11	1/2 "	3/4 "		1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	23.3			10.6	16.8	46.8	91.8	98.3	99.6	100									8	6	B-29/S4
	14.2			7.7	10.4	16.3	38.9	78.3	95.8	99.4	100								20	18	B-30/S10
	16.5			8.5	11.2	15.3	40.2	83.2	89.7	90.6	91.2	91.2	93.6	100					16	14	MW-12/S8
	18.2	-		11.4	15.5	31.5	67.0	97.2	99.8	100								Percent	. 12	10	MW-13/S6
	25.8			10.0	15.0	28.7	56.4	94.8	99.9	100								Percent Passing	18	16	MW-14/S9
	19.4			8.1	15.7	25.8	44.5	87.0	98.7	99.3	100								18	16	MW-15/S9
	20.9	22	46																12	10	MW-16/S6
	17.0			51.1	85.9	95.6	99.4	99.9	100										12	10	MW-16/S6



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Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/811	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	22.6			8.2	13.3	37.9	89.4	99.3	99.9	100									26	24	MW-16/S13
	19.4	18	36																16	14	MW-17/S8
	18.6			12.6	19.1	35.6	70.5	95.7	100										18	16	MW-17/S9
	24.0			9.1	13.3	29.0	72.9	97.9	99.9	100								Percent	26	24	MW-17/S13
	23.2			10.9	15.4	27.3	82.0	98.9	99.6	100								Percent Passing	14	12	MW-18/S7
	22.7			10.7	15.9	35.0	82.1	97.9	99.6	100									18	16	MW-18/S9
	26.0			7.9	11.0	22.9	64.1	93.2	99.9	100									16	.14	MW-19/S8
	20.9			12.5	18.9	51.6	86.4	97.0	99.7	99.9	100								24	22	MW-19/S12



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Construction Inspection and Materials Testing

Dry Unit Weight (pcf)	Natural Moisture %	Plasticity Index	Liquid Limit	No. 200	No. 100	No. 60	No. 40	No. 20	No. 10	No. 4	3/8"	1/2"	3/4"	 1 1/2"	2"	2 1/2"	Sieve Size	End Depth (ft.)	Begin Depth (ft.)	Boring No./Sample No.
	13.2			8.2	10.9	17.1	34.9	60.1	75.4	87.5	97.6	100						16	14	MW-20/S8
	21.8			9.1	15.1	31.1	67.8	94.0	99.4	100								18	16	MW-21/S9
	15.6			14.4	27.2	43.7	71.5	93.4	99.4	100								10	8	MW-22/S5
	21.0			9.1	13.0	21.9	50.6	93.0	98.9	99.0	99.2	100					Percent Passing	14	12	MW-22/S7
	21.2			10.2	16.3	28.1	55.6	88.6	98.1	99.8	100						Passing	14	12	MW-23/S7
	20.1			5.7	11.1	28.9	63.3	83.2	88.2	90.2	96.3	100						18		MW-24/S9
	16.6			14.4	23.7	62.4	90.3	99.3	100									10	8	MW-25/S5
	20.1			21.6	35.5	62.2	81.1	95.9	99.7	100								14	12	MW-25/S7



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Construction Inspection and Materials Testing

Boring No./Sample No.	MW-25/S9	MW-26/S4	MW-26/S13	
Begin Depth (ft.)	16	6	24	
End Depth (ft.)	18	8	26	
Sieve Size				Percent Passing
2 1/2"				d
2"				
1 1/2"				
1 =				
3/4"				
1/2"			100	
3/8"			98.6	
No. 4	100	100	97.4	
No. 10	98.6	99.4	95.4	
No. 20	92.5	95.9	76.9	
No. 40	62.3	82.2	47.2	
No. 60	22.0	55.5	29.1	
No. 100	12.8	31.8	16.4	
No. 200	9.5	17.1	11.9	
Liquid Limit				
Plasticity Index				
Natural Moisture %	24.5	4.0	20.0	
Dry Unit Weight (pcf)				

#### Appendix 3 Domestic Well Data

#### WRA Well Data (06/02/2017)

Coord.	Permit	Well Address	Well	Tax	State Plane	TOP OF	Comments
#	#		Owner	Parcel	Coordinates	Well	
						Elevation	
-	-	-	WILLIAM DRAINE	234-21.00-47.00	-	-	UNIMPROVED LOT
1224	NO TAG	26895 MT JOY RD	WILLIAM MERVIN	234-21.00-47.02	N 228500.24	28.13	2" PVC. 0.70' TALL. WELL IS 165' +/- FROM CL OF ROAD.
			DRAINE		E 697920.82		40'+/- TO THE RIGHT OF DWELLING, BY PUMP HOUSE.
-	-	-	POWER AND LOVE	234-21.00-140.00	-		UNIMPROVED LOT
			OUTREACH				
			MINISTRIES, INC.				
-	-	25709 HOLLYVILLE RD	EDUARDO GARZA &	234-21.00-140.01	-	-	NO WELL FOUND . NO RESPONSE FROM OWNER
			REYNA A. GARZA				
-	-	25728 HOLLYVILLE RD	JUDITH T. KING & H.	234-21.00-140.02	-	-	NO WELL FOUND . NO RESPONSE FROM OWNER
			RICHARD KING				PROBABLY OUTSIDE STUDY AREA
-		24861 LAWSON RD	JANEEN NEAL &	234-21.00-141.01	N 232448.52	37.05	4" PVC. 0.90' TALL. IN FRONT AND TO THE RIGHT OF
			STANLEY E. NEAL		E 698473.35		HOUSE. APPROX. 45' +/- FROM CL OF ROAD.
1205	216406	24847 LAWSON RD	JILL M. GOMEZ	234-21.00-141.02	N 232672.80	36.99	4" PVC. 0.70' TALL. IN FRONT AND TO THE LEFT OF
					E 698524.83		HOUSE. APPROX. 70' +/- FROM CL OF ROAD.
1207	221821	24835 LAWSON RD	JOSEPH M.	234-21.00-141.03	N 232761.43	37.34	4" PVC. 1.50' TALL. IN FRONT OF HOUSE.
			MCDONOUGH &		E 698437.71		APPROX. 70' +/- FROM CL OF ROAD.IN A BUSH.
			ANNA M.				
			MCDONOUGH				
1210	212692	24814 LAWSON RD	JOHN F. ARTHUR	234-21.00-141.04	N 231945.95	38.40	4" PVC. 1.10' TALL. BEHIND HOUSE.
					E 698342.31		APPROX. 180' +/- FROM CL OF ROAD.
1198	212693	24894 LAWSON RD	EDWIN F. BOOTH III	234-21.00-141.05	N 232117.18	37.19	4" PVC. 1.50' TALL. IN FRONT OF HOUSE.
					E 698436.83		APPROX. 55' +/- FROM CL OF ROAD.
1196	213762	24880 LAWSON RD	MIRNA ORTH L.	234-21.00-141.06	N 232274.91	37.86	4" PVC. 1.30' TALL. BEHIND HOUSE. UNDER SHED ROOF.
					E 698292.78		APPROX. 170' +/- FROM CL OF ROAD.

1200	216222	24866 LAWSON RD	NATHANIEL L. NORWOOD & HOLLY A. NORWOOD	234-21.00-141.07	N 232474.90 E 698382.87	37.58	4" PVC. 1.30' TALL. IN FRONT OF HOUSE.  APPROX. 40' +/- FROM CL OF ROAD.
1203	215743	24879 LAWSON RD	WILLIAM T. KNOWLES & JULIE ANN KNOWLES	234-21.00-141.08	N 232199.37 E 698537.48	36.84	4" PVC. 1.20' TALL. IN FRONT OF HOUSE. APPROX. 60' +/- FROM CL OF ROAD.
1194	191586	24910 HOLLYVILLE RD	MARK D. HESS &	234-21.00-142.00	N 232169.50	37.16	4" PVC. 1.40' TALL. IN FRONT OF HOUSE.
			PAMELA J. HESS		E 698774.44		APPROX. 120' +/- FROM CL OF ROAD.
1216	-	-	A. GLADYS BEATTY	234-21.00-142.01	-	-	UNIMPROVED LOT
-	159582	24868 HOLLYVILLE RD	LESA R. HARRIS	234-21.00-143.00	N 232457.77	35.94	2" PVC. 1.40' TALL. DIRECTLY BEHIND HOUSE.
					E 698891.68		APPROX. 230' +/- FROM CL OF ROAD.
1212	112579	24840 HOLLYVILLE RD	EDWARD KLOSOWSKI	234-21.00-143.01			2" PVC. 1.20' TALL. BEHIND AND TO THE RIGHT OF HOUSE.
							APPROX. 215' +/- FROM CL OF ROAD.
1213	-	-	R. ALICE DEATS,	234-21.00-144.00	-	-	UNIMPROVED LOT.
			TRUSTEE				
-	-	-	SUSSEX COUNTY	234-21.00-151.01			UNIMPROVED LOT
-	-	-	SUSSEX COUNTY	234-21.00-151.02	-	-	UNIMPROVED LOT
			SUSSEX COUNTY	234-21.00-151.03			UNIMPROVED LOT
-	-	-	BRIAN L. BURTON	234-21.00-152.00	-	-	UNIMPROVED LOT
-	-	-	FELICIA A. BURTON	234-21.00-152.04	-	-	UNIMPROVED LOT
-	-	-	FELICIA A. BURTON	234-21.00-152.05	-	-	UNIMPROVED LOT
1182	NO TAG	27041 MT JOY RD	EMMA LORETTA	234-21.00-153.00	N 227997.76	31.09	2" PVC. 1.3' TALL. DIRECTLY IN FRONT OF HOUSE
			ANDRIE		E 699193.22		APPROX. 30' +/- FROM CL ROAD
1192	NO TAG	27059 MT JOY RD	WILLIAM H. ANDRIE	234-21.00-154.00	N 228013.29	30.00	LOCATION IS GROUND ADJACENT TO WELL.
			JR.		E 699375.31	GROUND	WELL IS IN WELL HOUSE. ACCESS WAS DENIED

1184	NO TAG	27059 MT JOY RD	CALEB J. BAILEY & ANNIE J. BAILEY	234-21.00-155.00	N 227992.34 E 699492.57	31.34	2" PVC. 1.1' TALL. WELL IS LOCATED AT RIGHT REAR CORNER OF HOUSE.
1219	NO TAG	27077 MT JOY RD	CALEB J. BAILEY &	234-21.00-156.00	N 228003.05	31.09	2" IRON PIPE. FLUSH WITH GROUND. LOCATED BETWEEN
-	-	27073 MT JOY RD 27089 MT JOY RD	ANNIE J. BAILEY PAULA VICIE PINKETT	234-21.00-157.00	E 699577.49 -	-	TWO TRAILERS. APPROX 150' FROM CL OF ROAD  VACANT DWELLING. NO WELL FOUND
1186	84917	27103 MT JOY RD	ELIZABETH D. HARMON	234-21.00-158.00	N 227826.65 E 699781.90	33.45	2" PVC. 1.7' TALL. IN FRONT OF AND TO THE LEFT OF HOUSE. APPROX. 30' FROM CL ROAD.
-	-	27113 MT JOY RD	MARL HAYES	234-21.00-159.00	-	-	NO ONE HOME. NO WELL FOUND.
-	-	28001 MT JOY RD	LIZZIE COLLINS	234-21.00-160.00	-	-	SPOKE TO OWNER. DID NOT KNOW LOCATION OF WELL.
-	-	28011 MT JOY RD	THE APOSTOLIC FAITH CHURCH OF JESUS CHRIST THE LORD INC	234-21.00-161.00	-	-	CHURCH. NO WELL FOUND
-	-	28029 MT JOY RD	HENRY T. SMITH HEIRS	234-21.00-162.00	-	-	SPOKE TO RESIDENTS. DID NOT KNOW LOCATION OF WELL
-	-	28039 MT JOY RD	HENRY T. SMITH HEIRS	234-21.00-163.00	-	-	NO ONE HOME . NO WELL FOUND.
1143	-	28051 MT JOY RD	MARY NELSON & SIMON MANNINGS	234-21.00-164.00	N 227580.12 E 700529.82	26.15	WELL BURIED. SHOT TAKEN AT GRADE. APPROX LOCATION AS PER OWNER.
1142	NO TAG	26390 MT JOY RD	PAUL W. KERCHER II & CARRIE E. KERCHER	234-21.00-164.01	N 227532.35 E 700583.50	28.28	2" PVC. 2.2' TALL. TO THE LEFT OF HOUSE. APPROX. 60' +/- FROM CL OF MT JOY ROAD.
1140	NO TAG	28703 MT JOY RD	JOANNE HARRIS	234-21.00-165.00	N 227446.48 E 700711.10	27.60	4' PVC. 0.8' TALL. LOCATED DIRECTLY IN FRONT OF DWELLING.
1148	-	28091 MT JOY RD	GEORGE E. JOHNSON JR & MARILYN THOMAS	234-21.00-166.00	N 227439.29 E 700871.31	28.24 GROUND	NO ONE HOME. LOCATION AT CORNER OF PUMPHOUSE.
1179	76390	26276 MILLER ST	SHAWN D. N. COLEMAN & PAMELA ANN COLEMAN	234-21.00-172.00	N 228700.47 E 700990.92	30.24	2" PVC. 1.8' TALL. LOCATED BEHIND AND TO THE LEFT OF HOUSE

1177	NO TAG	26278 MILLER ST	NATHANIEL L.	234-21.00-173.00	N 228651.98	29.01	2" PVC. 0.7' TALL. LOCATED BEHIND DWELLING.
11,,	110 1710	20270 11112211101	PURNELL	23 1 22100 17 3100	E 700966.41	23.01	APPROX. 180' FROM CL OF ROAD.
1174	86186	-	GERALD F. FOREMAN,	234-21.00-174.00	N 228523.52	28.56	4" PVC. 1.3' TALL. LOCATED NEAR FRONT RIGHT CORNER
			JR		E 701049.88		OF LOT. APPROX. 50' FROM CL OF ROAD. NO DWELLING
1172	253363	26296 MILLER ST	MICHAEL VIDELOCK	234-21.00-175.00	N 228398.20	30.13	4" PVC. 1.5' TALL. LOCATED DIRECTLY IN FRONT OF HOUSE
					E 701011.62		APPROX. 40' FROM CL OF ROAD
1168	157574	26312 MILLER ST	GLORIA A. HICKMAN	234-21.00-176.00	N 228312.23	29.91	2" PVC. 2.7' TALL. LOCATED DIRECTLY IN FRONT OF HOUSE
					E 700970.02		APPROX. 40' FROM CL OF ROAD
-	-	-	CLAYTON SNEAD	234-21.00-177.00	-	-	UNIMPROVED LOT
1166	-	26330 MILLER ST	MATTHEW B.	234-21.00-178.00	N 228139.21	30.11	APPROX. LOCATION AS PER OWNER.
			JOHNSON		E 700889.33	GROUND	LOCATION AT GRADE
1165	NO TAG	26336 MILLER ST	JACQUELINE F.	234-21.00-179.00	N 228043.12	27.73	WELL IS COVERD BY AN ORNIMENTAL LIGHTHOUSE.
			MARSHALL		E 700844.77	GROUND	LOCATION AT GROUND ADJACENT TO WELL.
1158	NO TAG	26352 MILLER ST	PAMELA STOKLEY	234-21.00-180.00	N 227891.21	29.20	2" PVC. 2.7' TALL. IN FRONT OF AND TO THE LEFT OF
					E 700727.72		HOUSE. APPROX. 93' FROM CL OR ROAD
1150	NO TAG	26374 MILLER ST	ARINTHIA A. PEACOCK	234-21.00-182.00	N 227745.23	27.45	2" PVC. 1.5' TALL. OPPOSITE FRONT RIGHT CORNER OF
					E 700713.81		HOUSE. 47.5' FROM CL OF ROAD
		-	JANICE L. HOPKINS	234-21.00-183.00	-	-	UNIMPROVED LOT
1152	NO TAG	26363 MILLER ST	GEORGE E. SNOW &	234-21.00-184.00	N 227771.37	27.15	4" PVC 0.9' TALL IN FRONT OF HOUSE
			SARAH E. SNOW		E 700834.13		ASSUMED ABANDONDED.
1154	NO TAG	26363 MILLER ST	GEORGE E. SNOW &	234-21.00-184.00	N 227710.96	28.06	2" PVC. 1.2' TALL. OPPOSITE BACK RIGHT CORNER OF
			SARAH E. SNOW		E 700916.63		HOUSE. APPROX 152' FROM CL OF ROAD
1156	106075	26353 MILLER ST	GEORGE E. SNOW &	234-21.00-185.00	N 227796.52	27.76	2" PVC. 1.1' TALL. BEHIND AND TO THE RIGHT OF HOUSE
			SARAH E. SNOW		E 700976.48		NEAR PROPERTY LINE. APPROX. 172' FROM CL OF ROAD
1161	75562	26335 MILLER ST	DAVID L. BRIDDELL	234-21.00-187.00	N 227964.41	29.90	4" PVC. 1.4' TALL. NEAR RIGHT FRONT CONER OF LOT.
					E 700947.19		APPROX. 78' FROM CL OF ROAD.
1163	NO TAG	26335 MILLER ST	DAVID L. BRIDDELL	234-21.00-187.00	N 228069.89	31.59	4" PVC. 1.6' TALL. NEAR LEFT SIDE OF PROPERTY.
					E 700992.23		APPROX. 77' FROM CL OF ROAD.
-	-	-	DAVID L. BRIDDELL	234-21.00-188.00	-	-	UNIMPROVED LOT
-	-	26315 MILLER ST	WILMINGTON	234-21.00-189.00	-	-	ABANDONED HOUSE. NO WELL FOUND
			SAVINGS FUND				
			SOCIETY				

1170	NO TAG	26305 MILLER ST	DAVID NOCKS &	234-21.00-190.00	N 228347.43	28.48	2' PVC. 0.8' TALL. IN FRONT OF LEFT SIDE OF HOUSE.
			TAMEKA R. HICKS		E 701072.40		APPROX. 40' FROM CL OF ROAD.
-	-	-	JOANNE V. HARRIS	234-21.00-191.00	-	-	UNIMPROVED LOT
	-	-	ASHBURN AT	234-21.00-394.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-395.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-396.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-397.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-398.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-399.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-400.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-401.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-402.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-403.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-404.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-419.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	- 1	-	ASHBURN AT	234-21.00-420.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-421.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				

-	-	-	ASHBURN AT	234-21.00-422.00	-		UNIMPROVED LOT
			JOHNSONVILLE				
_	_	-	ASHBURN AT	234-21.00-423.00	-	_	UNIMPROVED LOT
			JOHNSONVILLE				
-	-	-	ASHBURN AT	234-21.00-424.00	-	-	UNIMPROVED LOT -
			JOHNSONVILLE				
	-	-	ASHBURN AT	234-21.00-425.00	-	-	UNIMPROVED LOT
			JOHNSONVILLE				
1333	-	28979 SYCAMORE LN	JOHN M. AMODEI SR	234-22.00-3.00	N 233490.47	31.29	WELL IN PUMP HOUSE. LOCATED GROUND ADJACENT TO
					E 704971.41	GROUND	FRONT RIGHT CORNER OF PUMP HOUSE. WELL SHARED
							WITH 234-22.00-3.20 APPROX 490' FROM CL OF ROAD.
1315	NO TAG	25148 TOWNSEND RD	MILDRED L. KRAUSE	234-22.00-3.01	N 234236.91	33.31	2" PVC. 1.0' TALL. IN FRONT OF HOUSE.
					E 706103.01		APPROX 86' FROM CL OF ROAD
-	-	-	H. BRENT MOORE &	234-22.00-3.03	-	-	THIS PARCEL IS A RIGHT OF WAY
			NANCY H. MOORE				
1332	-	28639 HARMONY	HUGH ELLIOTT	234-22.00-3.04	N 233154.48	31.42	APPROX. WELL LOCATION AS PER OWNER. WELL IS BELOW
		CEMETERY RD	WRIGHT		E 704969.84	GROUND	GRADE IN FRONT OF GARAGE. 184'+/- FROM CL OF ROAD.
1330	NO TAG	28649 HARMONY	CAROL L. TARBOX &	234-22.00-3.05	N 233092.99	31.63	4" IRON PIPE. 0.6' TALL. 20' BEHIND RIGHT REAR CORNER
		CEMETERY RD	WILLIAM TARBOX		E 705085.04		OF HOUSE. APPROX. 180' FROM CL OF ROAD
1335	-	28649 HARMONY	DENNIS G. HARRISON	234-22.00-3.06	N 233762.37	31.60	APPROX. WELL LOCATION AS PER OWNER. WELL IS BELOW
		CEMETERY RD	& KATHY MAY		E 704843.10	GROUND	GRADE. APPROX. 675' FROM CL OF ROAD ADJACENT TO
			HARRISON				PUMP HOUSE.
-	-	-	GARY D. STEWART &	234-22.00-3.07	-	-	LOT IMPROVED BY GARAGE , THERE IS NO WELL.
			KERRY L H STEWART				
1325	8127	25254 TOWNSEND RD	J. LAYTON MOORE &	234-22.00-3.08	N 233431.44	33.53	2" PVC60' TALL. APPROX. 158' FROM CL OF ROAD IN
			MARGARET E. MOORE		E 705588.67		FRONT OF A VERY LARGE BOAT
-	-	-	RICHARD C. STOUDT,	234-22.00-3.09	-	-	UNIMPROVED LOT
			TRUSTEE & BARBARA				
			STOUDT, TRUSTEE				

1286	NO TAG	28697HARMONY CEMETERY RD	ROBERT G. REBMAN JR & AMY BETH REBMAN	234-22.00-3.10	N 232766.76 E 705478.97	30.52	6" PVC. 0.7' TALL. LOCATED NEAR FRONT RIGHT CONER OF LOT. APPROX 30' FROM CL OF TOWNSEND RD.
-	-	28685HARMONY CEMETERY RD	RICHARD C. STOUDT, TRUSTEE & BARBARA STOUDT, TRUSTEE	234-22.00-3.11	-	-	WELL NOT FOUND
-	-	28661HARMONY CEMETERY RD	KEITH J. BRIMMER & KAREN M. BRIMMER	234-22.00-3.12	-	-	WELL NOT FOUND
1339	NO TAG	25208 TOWNSEND RD	AMAR N. SHARMA & MARY A. SHARMA	234-22.00-3.13	N 233741.65 E 705652.65	33.61	4" PVC. 1.4' TALL. DIRECTLY IN FRONT OF HOUSE. APPROX. 235' FROM CL OF ROAD.
1337	76073	25234 TOWNSEND RD	EDMUND L. GUDITUS & PATRICIA A. GUDITUS	234-22.00-3.14	N 233630.81 E 705586.14	30.48	2" PVC. 1.1' TALL. BEHIND AND TO THE RIGHT HOUSE. APPROX. 240' FROM CL OF ROAD UNDER METAL GRATE.
-	-	-	ELIZIBETH MONTE WOOLEYHAN & ROGER B. WOOLEYHAN	234-22.00-3.15		-	UNIMPROVED LOT
1327	NO TAG	25288 TOWNSEND RD	GERALD C. BROWN & JENNIFER LITTLEFIELD	234-22.00-3.16	N 233085.72 E 705534.35	31.04	2" PVC . 0.8' TALL. NEAR RIGHT SIDE OF DRIVEWAY. APPROX 80' FROM CL OF ROAD
1324	157560	25154 TOWNSEND RD	GARY D. STEWART & KERRY HANRAHAN STEWART	234-22.00-3.17	N 234358.79 E 705605.41	33.07	4" PVC. 1.6' TALL. IN FRONT OF AND TO THE LEFT OF HOUSE. APPROX 600' FEET FROM CL OF ROAD.
-	-	-	ANTHONY E. SING & CATHY F. SING & GARY STEWART & KERRY H. STEWART	234-22.00-3.18	-	-	UNIMPROVED LOT
1333	-	29003 TOWNSEND RD	JOHN M. AMODEI JR & LAUREN M. AMODEI	234-22.00-3.20	N 233490.47 E 704971.41	31.29 GROUND	WELL IN PUMP HOUSE. LOCATED GROUND ADJACENT TO FRONT RIGHT CORNER OF PUMP HOUSE. WELL SHARED WITH 234-22.00-3.00 APPROX 490' FROM CL OF ROAD.
-	-	-	JOHN M. AMODEI SR	234-22.00-3.21	-	-	THIS PARCEL IS A RIGHT OF WAY

1326	NO TAG	25270 TOWNSEND RD	DUSTIN B. THIBAULT	234-22.00-3.22	N 233179.10	30.95	2" PVC. 1.4' TALL. APPROX. 85' FROM CL OF ROAD NEXT
			& KRISTY L. THIBAULT		E 705549.29		TO DRIVEWAY. APPROX. 110' FROM CL OF ROAD.
-	-	-	DUSTIN B. THIBAULT	234-22.00-3.23	-	-	THIS PARCEL IS A RIGHT OF WAY
			& KRISTY L. THIBAULT				
1317	193599	29165 KRAUSE LN	MARY LOU KRAUSE	234-22.00-3.26	N 234901.61	32.91	4" PVC. 1.0' TALL. BEHIND AND TO THE LEFT OF HOUSE
					E 705530.52		NEAR END OF DRIVE. HOUSE IS APPROX. 1000' FROM
							COUNTY ROAD ON KRAUSE LANE.
1321	25180	29457 KRAUSE LN	ANDREW W.	234-22.00-3.29	N 234689.27	30.68	4" PVC. 1.5' TALL. BEHIND AND TO THE RIGHT OF SMALL
			MACNAMARA &		E 705671.42		YELLOW SHED. HOUSE IS APPROX. 700' FROM COUNTY
			ELIZABETH M. MAIN				ROAD ON KRAUSE LANE.
-	-	-	MMW INVESTMENTS	234-22.00-4.00	-	-	UNIMPROVED LOT
			LLC				
1313	180216	25130 TOWNSEND RD	B&B LAND CORP.	234-22.00-4.01	N 234462.58	32.35	2" PVC. 1.0' TALL. BEHIND HOUSE IN FRONT OF POOLNEXT
					E 706139.64		TO POOL PUMP. APPROX. 165' FROM CL OF ROAD.
1311	NO TAG	25118 TOWNSEND RD	JAMES E. DESHAZO &	234-22.00-4.02	N 34635.23	32.64	4" PVC. 1.3' TALL. BEHIND HOUSE. BESIDE AUTO SHOP.
			LISA A. DESHAZO		E 706107.18		BEHIND SMALL SHED. APPROX. 280' FROM CL OF ROAD.
1307	196927	25094 TOWNSEND RD	RICHARD P.	234-22.00-4.03	N 234789.38	32.07	2" PVC. 1.5' TALL. BEHIND AND TO THE RIGHT OF HOUSE.
			BEAUDOIN		E 706259.18		APPROX. 220' FROM CL OF ROAD.
1309	205781	25076 TOWNSEND RD	FRANCIS J. GEORGE &	234-22.00-4.04	N 234848.71	30.50	4" PVC. 0.7' TALL. BEHIND AND TO THE LEFT OF HOUSE
			LINDA P. GEORGE		E 706283.34		NEXT TO A SHED. APPROX. 230' FROM CL OF ROAD.
-	-	-	DAWN M. KERR	234-22.00-4.05	-	-	UNIMPROVED LOT
1305	211264	25046 TOWNSEND RD	FERN T. HAUG	234-22.00-4.06	N 235106.93	30.75	4" PVC. 1.0' TALL. BEHIND HOUSE NEXT TO THE FRONT
					E 706425.64		LEFT CORNER OF A LARGE METAL OUT BUILDING.
							APPROX. 230' FROM CL OF ROAD.
1303	NO TAG	25046 TOWNSEND RD	GARY ALLEN	234-22.00-4.07	N 235255.51	32.48	4" PVC. 1.5' TALL. OPPOSITE BACK LEFT CORNER OF HOUSE
			LAMBERT, SR. &		E 706551.77		NEAR PROPERTY LINE. APPROX. 195'
			VICTORIA LAMBERT				FROM CL OF ROAD
1300	246193	25016 TOWNSEND RD	JULIA B. ELLIS-HALL	234-22.00-4.08	N 235360.29	32.15	4" PVC. 2.0 TALL. IN FRON OF HOUSE.
					E 706761.92		APPROX. 60' FROM CL OF ROAD
1350	NO TAG	25016 TOWNSEND RD	CHARLES E. MAIN SR	234-22.00-5.00	N 231813.63	29.99	4" PVC. 0.8' TALL. OPPOSITE RIGHT FRONT CORNER OF
					E 705055.04		HOUSE NEXT TO DRIVEWAY.
							APPROX. 100' FROM CL OF ROAD.
			SUSSEX COUNTY	234-22.00-7.00			
			SUSSEX COUNTY	234-22.00-8.00			

-	-	-	HARMONY CEMETERY INC	234-22.00-9.00	-	-	CEMETERY NO WELL FOUND
-	-	-	HARMONY CEMETERY INC	234-22.00-10.02	-	-	UNIMPROVED LOT
1260	-	26405 MT JOY ROAD	DONALD B. CARMINE	234-22.00-17.00	N 228495.52	31.43	4" PVC. 1.1' TALL. DIRECTLY OPPOSITE RIGHT SIDE OF
			& NATOSHA N.		E 708467.89		HOUSE. APPROX 600' FROM CL OF MT JOY ROAD. TAG
			CARMINE				NOT LEGIBLE
1251	-	28799 MT JOY ROAD	WILLIAM E. STREET	234-22.00-17.01	N 228151.66	25.89	WELL INSIDE OF PUMPHOUSE. LOCATED SOUTHWEST
					E 707668.18	GROUND	CORNER OF PUMPHOUSE AT GRADE.
1254	NO TAG	28855 MT JOY ROAD	CAROL A. STRIPLING	234-22.00-17.02	N 227964.20	26.25	2" PVC. 0.7' TALL. NEAR RIGHT FRON CORNER OF LOT.
					E 708208.81		APPROX. 30' FROM CL LINE OF ROAD.
1248	-	28755 MT JOY ROAD	JENNIE A. AMES	234-22.00-17.03	N 228097.15	27 .89	WELL IS IN PUMPHOUSE. LOCATED FRONT LEFT CORNER
					E 707182.58	GROUND	OF PUMPHOUSE AT GRADE.
-	-	MARKS LANE	BRIDGETTE M. WROTEN	234-22.00-17.04	-	-	THIS IS A RIGHT OF WAY
1252	NO TAG	28825 MT JOY ROAD	WILLIAM E. STREET	234-22.00-17.05	N 227992.15	26.75	2"PVC. 1.1' TALL. APPROX. 30 FROM CI OF ROAD
					E 707934.12		
1256	NO TAG	28839 MT JOY ROAD	CLAYTON M. SAMPLE	234-22.00-17.06	N 227975.38	26.90	2" PVC. 2.0' TALL. APPROX 30' FROM CL OR ROAD.
			& KATINA SAMPLE		E 708070.55		NEAR RIGHT FRONT CORNER. OF LOT.
1294	-	30013 MARKS LANE	SALLY B. MARKS	234-22.00-17.07	N 228392.03	24.82	WELL UNDER ORNIMENTAL LIGHTHOUSE APPROX. 400'
					E 707716.81	GROUND	FROM CL OF COUNTY ROAD. NOT ACCESSIBLE.
							LOCATION IS GROUND ADJACENT TO WELL.
-	-	-	SALLY B. MARKS	234-22.00-17.08	-	-	UNIMPROVED LOT
1270	NO TAG	31000 AYERS LANE	MILTON T. AYERS	234-22.00-17.09	N 228546.65	37.67	2" PVC. 0.50 TALL. WELL IS OPPOSITE THE NORTH END OF
					E 707305.93		FIRST MOBILE HOME. APPROX. 520' FROM CL OF COUNTY
							ROAD
1272	98258	31002 AYERS LANE	MILTON T. AYERS	234-22.00-17.09	N 228526.18	43.39	4" PVC. 1.0' TALL. WELL IS BEHIND SECOND MOBILE HOME
					E 707443.33		IN A WOODEN BOX. APPROX. 520' FROM CL OF COUNTY
							ROAD
1293	NO TAG	30021 MARKS LANE	BRIDGETTE M.	234-22.00-17.10	N 228807.51	26.37	2" PVC. 0.7' TALL. BEHIND GARAGE. APPROX 840' FROM
			WROTEN		E 707927.21		CL OF COUNTY ROAD.

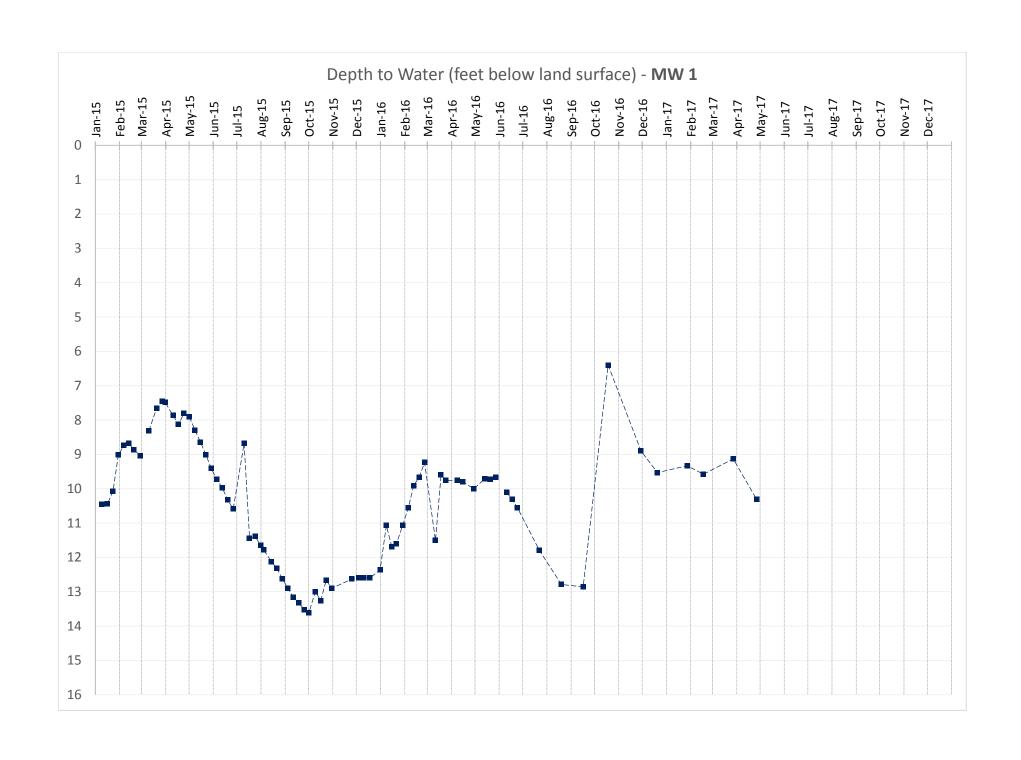
1249	NO TAG	28781 MT JOY ROAD	CAROLYN N. JONES	234-22.00-17.11	N 228050.41 E 707363.20	26.54	4" PVC. 0.8' TALL. APPROX. 30' FROM CL OF COUNTY ROAD ON LEFT SIDE OF DRIVEWAY.
1258	NO TAG	28867 MT JOY ROAD	YOUNG JE BYUN	234-22.00-18.00	N 227961.46 E 708298.81	26.87	4" PVC. 1.3' TALL. APPROX. 30' FROM CL OF ROAD OPPOSITE RIGHT FRONT CORNER OF HOUSE.
-	-	-	PRISCILLA LANE	234-22.00-28.00	-	-	UNIMPROVED LOT
1359	154209	25400 TOWNSEND ROAD	PHYLLIS A. WILLIS	234-22.00-29.00	N 232073.17 E 704949.58	30.35	4' PVC. 1.7' TALL. LEFT SIDE OF LOT BEHIND GARAGE. APPROX. 280' FROM CL OF ROAD.
1348	NO TAG	25388 TOWNSEND ROAD	WILLIAM R. ZEGLIN	234-22.00-30.00	N 232340.21 E 704922.73	33.55	4' PVC. 1.2' TALL. RIGHT SIDE OF LOT. TO THR RIGHT OF CAR REPAIR SHOP.  APPROX. 400' FROM CL OF ROAD.
1346	15840	29627 QUIET WOODS ROAD	LINDA F. SAVAGE	234-22.00-31.00	N 232454.17 E 704962.37	32.31	4" PVC. 0.8' TALL. APPROX 400' FROM CL OF COUNTY ROAD. TO THE LEFT OF QUIET WOODS ROAD.
1344	251579	29649 QUIET WOODS ROAD	JOSHUA R. LYNN	234-22.00-31.01	N 232496.33 E 704965.89	32.21	4" PVC. 1.2' TALL. APPROX 420' FROM CL OF COUNTY ROAD. TO THE LEFT OF QUIET WOODS ROAD.
1342	59720	25350 TOWNSEND ROAD	RICHARD E. CLINE & CYNTHIA L. CLINE	234-22.00-32.00	N 232526.88 E 705213.24	30.39	4" PVC 0.8' TALL. BEHIND AND IN LINE WITH RIGHT SIDE OF HOUSE. ABOUT 30' FROM HOUSE
1286	172791	28688 HARMONY CEMETARY ROAD	HORACE WRIGHT & LUCILLE WRIGHT	234-22.00-33.00	N 232607.07 E 705240.55	29.74	4" PVC. 0.7' TALL. BEHIND AND TO THE RIGHT OF HOUSE. APPROX 190' FROM CL OF ROAD.
1288	NO TAG	28668 HARMONY CEMETARY ROAD	WILMA L. BESNOSKA	234-22.00-34.00	N 232735.73 E 705086.39	30.15	4" PVC. 1.0' TALL. NEXT TO DRIVEWAY. APPROX 140' FROM CL OF ROAD.
1290	111860	28658 HARMONY CEMETARY ROAD	PAULA DENISE SHAMBLIN	234-22.00-35.00	N 232795.66 E 705000.61	29.58	2" PVC. 0.6' TALL. DIRECTLY IN FRONT OF HOUSE. APPROX 120' FROM CL OF ROAD.
-	-	-	WILLIAM T. HURDLE III & ELIZABETH C. HURDLE	234-16.00-26.00	-	-	UNIMPROVED LOT
1295	216342	24906 TOWNSEND ROAD	WILLIAM T. HURDLE III & ELIZABETH C. HURDLE	234-16.00-26.01	N 236242.36 E 707544.81	28.38	4' PVC. 2.0' TALL. BEHIND HOUSE. IN LINE WITH FRONT OF GARAGE. APPROX 250' FROM CL OF ROAD.
1297	230152	24903 TOWNSEND ROAD	SUSAN M. FISHER	234-16.00-26.02	N 235870.90 E 707712.00	33.90	4' PVC. 1.0' TALL. BEHIND AND IN LINE WITH RIGHT SIDE OF HOUSE. APPROX. 180' FROM CL OF ROAD.

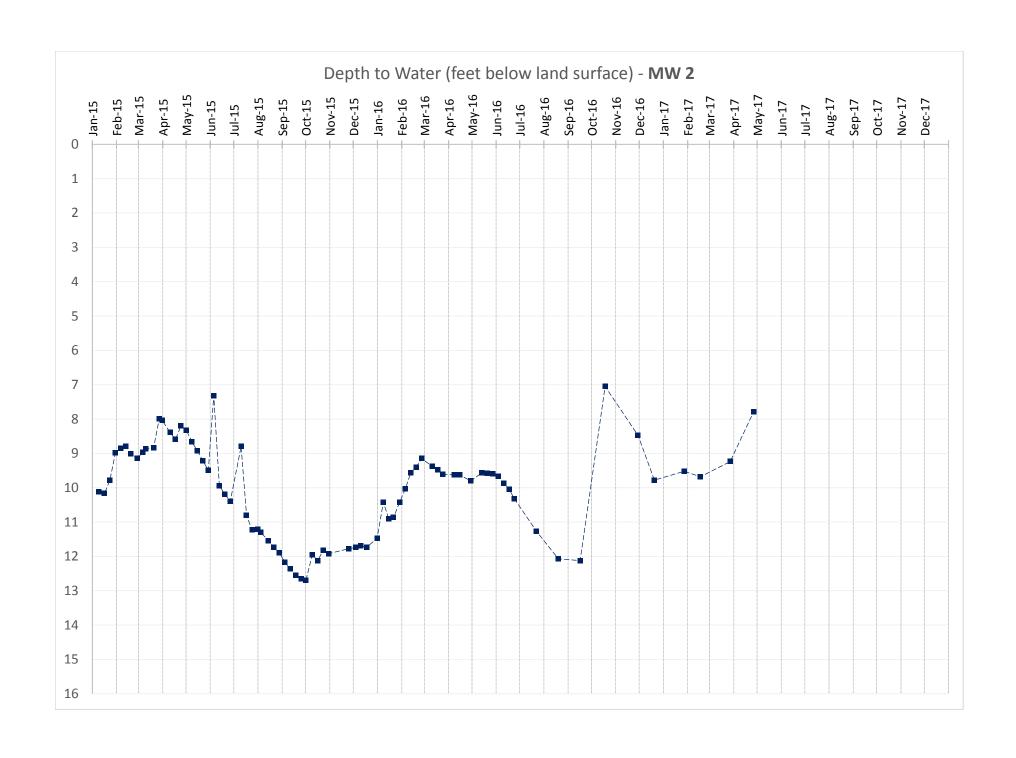
-	-	-	MMW, INVESTMENTS	234-16.00-26.03	-	-	UNIMPROVED LOT
-	-	-	LLC NEW DOUBLE EAGLE	234-16.00-797.00	-	-	UNIMPROVED LOT
			FARMS LLC				
-	-	-	NEW DOUBLE EAGLE	234-16.00-798.00	-	-	UNIMPROVED LOT
			FARMS LLC				
-	-	-	MOUNTAIRE FARMS	234-28.00-1.00	-	-	UNIMPROVED LOT
			OF DELAWARE INC				
-	-	-	MOUNTAIRE FARMS	234-28.00-2.00	-	-	UNIMPROVED LOT
			OF DELAWARE INC				
-		-	MOUNTAIRE FARMS	234-28.00-3.00	-	-	UNIMPROVED LOT
			OF DELAWARE INC				
-	-	-	DELMARVA POWER	234-28.00-18.01	-	-	UNIMPROVED LOT
			AND LIGHT CO				
1228	NO TAG	26642 MARYLAND	PATRICK MILLER &	234-28.00-18.02	N 226860.67	26.68	4" PVC. 1.0' TALL. DIRECTLY IN FRONT OF HOUSE.
		CAMP ROAD	STEPHEN MILLER		E 706665.47		APPROX 140' FROM CL OF ROAD.
1232	NO TAG	26638 MARYLAND	STEVEN W. LAWVER &	234-28.00-177.00	N 227071.67	26.69	2" PVC. 0.5' TALL. APPROX 25' FROM CL OF ROAD.
		CAMP ROAD	KATHY D. LAWVER		E 707091.44		JUST TO THE RIGHT OF THE DRIVEWAY.
1235	100294	26584 MARYLAND	GARY A. FOWLER &	234-28.00-178.00	N 227212.87	26.48	2" PVC. 1.0' TALL. NEAR LEFT FRON CORNER OF LOT.
		CAMP ROAD	ARLENE FOWLER		E 707284.44		APPROX 38' FROM CL OF ROAD.
-	-	-	LONG NECK BUILDERS	234-28.00-179.00	-	-	UNIMPROVED LOT
			INC				
1237	81006	26584 MARYLAND	ROBERT E. MERRY JR	234-28.00-180.00	N 227442.68	26.25	4" PVC. 1.0' TALL. IN FRONT OF RIGHT SIDE OF HOUSE.
		CAMP ROAD			E 707552.41		APPROX. 50' FROM CL ROAD.
1239	80606	26584 MARYLAND	WILLIAM B. SZLEMKO	234-28.00-181.00	N 227527.66	26.61	2" PVC. 2.0' TALL. DIRECTLY IN FRONT OF HOUSE.
		CAMP ROAD	& DOREEN A.		E 707668.57		APPROX 50' FROM CL OF ROAD.
			SZLEMKO				
-	-	-	RAMONA A. JEANDELL	234-28.00-182.00	-	-	UNIMPROVED LOT
1243	80035	26584 MARYLAND	ZEYLA J. ESCUDERO DE	234-28.00-183.00	N 227650.73	25.42	2" PVC. 1.5' TALL OPPOSITE FRONT LEFT OF HOUSE.
		CAMP ROAD	RUEDA		E 707852.88		APPROX. 35' FROM CL OF ROAD.

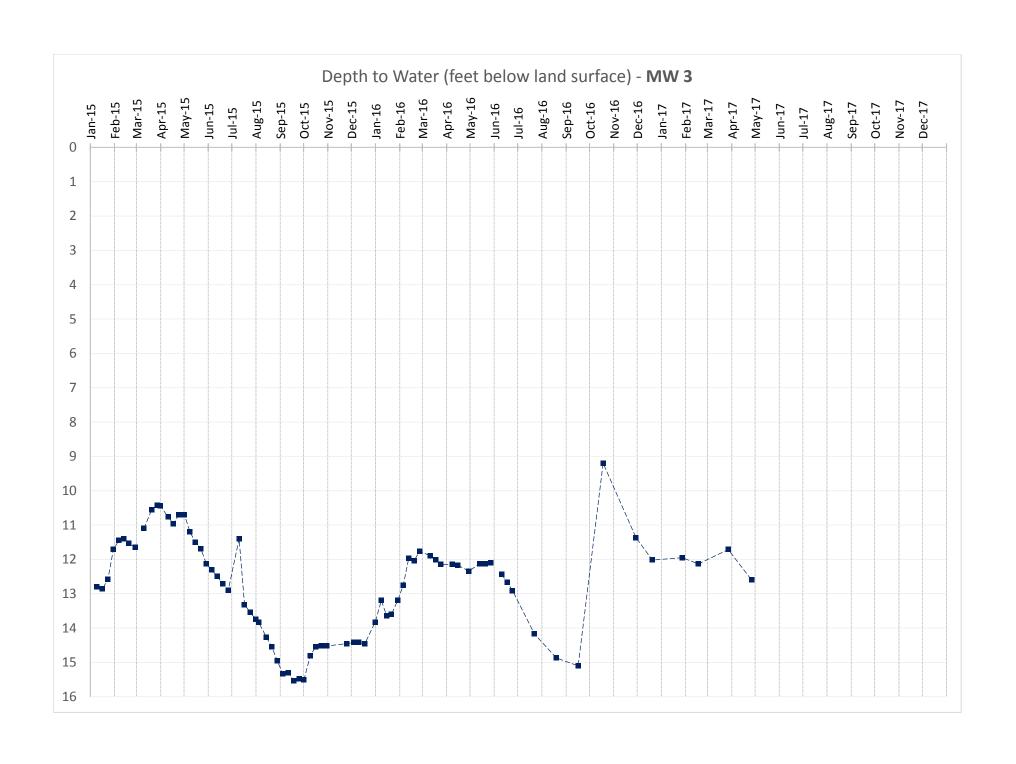
1245	80607	28840 MT JOY ROAD	TODD R. KIRCHOFF 7	234-28.00-184.00	N 227870.75	26.44	2" PVC. 1' TALL. DIRECTLY IN FRONT OF HOUSE IN BIRD
1243	00007	20040 WH JOT NOAD	THERESA E. KIRCHOFF	254 20:00 104:00	E 708092.90	20.44	BATH PEDESTAL. APPROX. 70' FROM CL OF MT JOY ROAD.
1262	172908	28822 MT JOY ROAD	ELLA M. COLLICK BAILEY	234-28.00-185.00	N 227934.60 E 707766.67	27.04	4" PVC1' TALL. NEAR FRONT RIGHT CORNER OF LOT. APPROX. 40' FROM CL OF ROAD.
1264	NO TAG	28804 MT JOY ROAD	MICHAEL F. DOLLAR & EVA M. DOLLAR	234-28.00-186.00	N 227935.79 E 707662.54	28.45	4' PVC. 1.1' TALL. OPP RIGHT FRONT CORNER OF THE HOUSE. APPROX 40' FROM THE CENTER OF THE ROAD.
1266	98166	28790 MT JOY ROAD	LARRY L. DAVIS & LINDA A. DAVIS	234-28.00-187.00	N 27939.88 E 707509.95	26.73	2" PVC. 0.75' TALL. OPP. RIGHT FRONT CORNER OF HOUSE. APPROX 60' FROM CL OF ROAD.
1268	-	28774 MT JOY ROAD	AUDREY E. BASS	234-28.00-188.00	N 227959.47 E 707369.58	28.19 GROUND	WELL INSIDE ORNIMENTAL LIGHTHOUSE. NOT  ACCESSABLE. LOCATION AT GROUND ADJACENT TO WELL.  APPROX. 60' FROM CL OF ROAD.
1269	99013	28760 MT JOY ROAD	JEFFREY L. LESSIG SR & ROSE M. LESSIG	234-28.00-189.00	N 227953.70 E 707266.04	27.82 GROUND	2" PVC. 0.5' TALL. IN FRONT OF LEFT SIDE OF HOUSE INSIDE DECORATIVE WELL. LOCATION AT GROUND APPROX 75' FROM CL OF ROAD. ADJACENT TO WELL.
1230	86150	26638 MARYLAND CAMP ROAD	STEPHEN B. CORDREY  & MICHAEL S.  CORDREY	234-28.00-190.00	N 226930.58 E 706777.03	27.65	2" PVC. 0.7' TALL. DIRECTLY IN FRONT OF HOUSE.  APPROX. 125' FROM CL OF ROAD.
1281	-	28642 MT JOY ROAD	GEORGE A. HUNTER SR & CHRISTINE L. HUNTER	234-28.00-191.00	N 227626.69 E 706147.00	27.57 GROUND	WELL INSIDE OF ORNIMENTAL LIGHTHOUSE. NOT ACCESSABLEAPPROX. 240' FROM CL OF ROAD. LOCATED GROUND ADJACENT TO WELL.
1279	87483	28658 MT JOY ROAD	JAMES E. WELSH & ADALINE B. WELSH	234-28.00-192.00	N 227659.81 E 706441.26	27.45	2" PVC. 1.5' TALL. DIRECTLY BEHIND HOUSE APPROX 250' CROM CL OF ROAD.
1278	-	28672 MT JOY ROAD	BARBARA L. WELSH	234-28.00-193.00	N 227622.88 E 706308.57	27.45 GROUND	WELL DIRECTLY BEHIND HOUSE INSIDE A DECORATIVE WINDMILL. APPROX. 260' FROM CL OF ROAD. WELL NOT ACCESSABLE. LOCATED GROUND ADJACENT TO WELL.
-	-	28692 MT JOY ROAD	MERRILL P. HORNE & PRISCILLA L. HORNE	234-28.00-194.00	-	-	OWNER REFUSED ACCESS.
1276	83899	28702 MT JOY ROAD	DIANE LUTZ	234-28.00-195.00	N 227705.29 E 706690.44	28.27	4" PVC. 1.1' TALL. BEHIND AND OPPOSITE BACK RIGHT CONER OF HOUSE. APPROX. 240' FROM CL OF ROAD.
1274	82421	28720 MT JOY ROAD	GERARD C. FLAHERTY & DEBORAH L. FLAHERTY	234-28.00-196.00	N 227913.08 E 706911.64	28.27	2" PVC. 1.2' TALL APPROX. 60' FROM CL OF ROAD. NEXT TO DRIVEWAY.

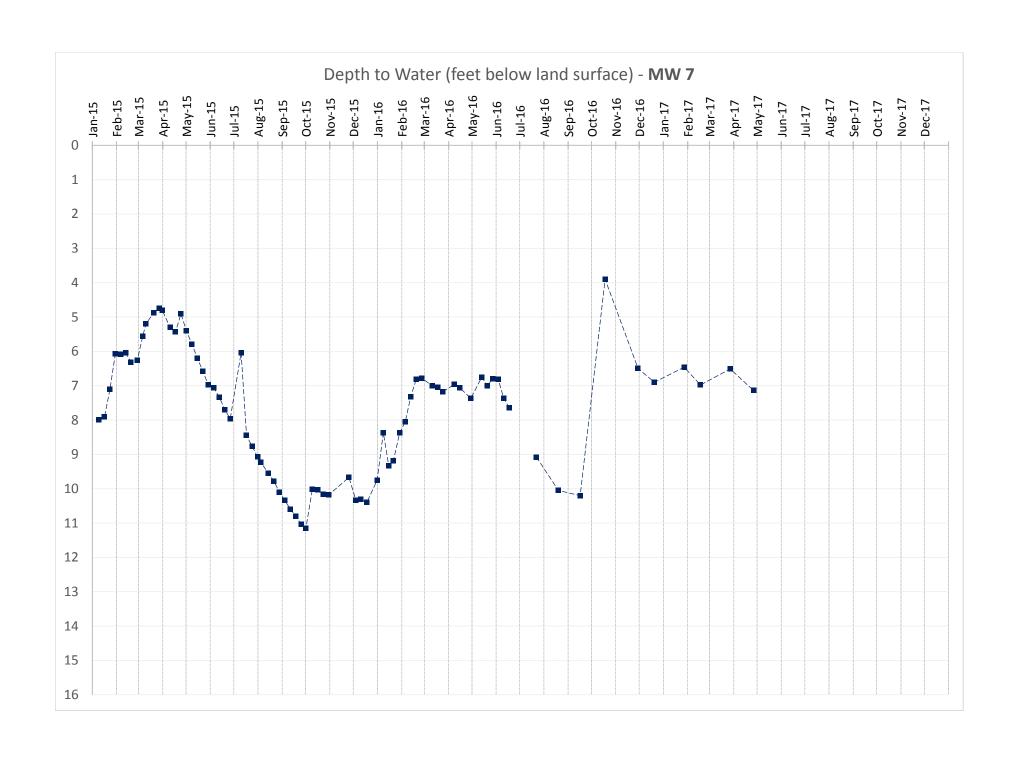
1364	86145	COUNTY PROPERTY	SUSSEX COUNTY	234-22.00-12.00	N 235099.75	29.14	4" PVC. 2.8' TALL. LOCATED APPROX 3,200' DUE NORTH OF
	MW-1				E 709525.39		THE INLAND BAYS OFFICE ALONG A SMALL DIRT ROAD IN A
							PATCH OF TREES. JUST EAST OF A BORROW PIT.
1365	238969	COUNTY PROPERTY	SUSSEX COUNTY	234-22.00-16.00	N 227969.73	27.55	4' METAL CASEING. 2.4' TALL LOCATED APPROX. 70'
	MW-25				E 708492.28		NORTH OF THE CENTERLINE OF MT JOY ROAD. APPROX
							200' EAST OF 28867 MT JOY ROAD
1367	238967	COUNTY PROPERTY	SUSSEX COUNTY	234-22.00-16.00	N 228988.61	29.66	4' PVC. 2.5' TALL. APPROX 1100' NORTH OF THE
	MW-23				E 708618.95		CENTERLINE OF MT JOY ROAD .
							ADJACENT TO 28867 MT JOY ROAD.
1373	86150	COUNTY PROPERTY	SUSSEX COUNTY	234-22.00-16.00	N 231489.25	37.07	6" PVC. 2.2' TALL. APPROX 170' SOUTH OF THE
	MW-6				E 708004.57		CENTERLINE OF INLAND BAYS ROAD WITHIN THE
							DELMARVA POWER RIGHT OF WAY.
1370	208213	COUNTY PROPERTY	SUSSEX COUNTY	234-22.00-10.00	N 233223.62	45.42	4" METAL. 1.9' TALL. APPROX 1500' NORTH OF INLAND
	MW-11				E 707185.07		BAYS ROAD ON AN UNIMPROVED ROAD THROUGH THE
							WOODS. ENTRANCE TO ROAD IS APPROX 525' WEST OF
							CENTERLINE OF DELMARVA POWER RIGHT OF WAY

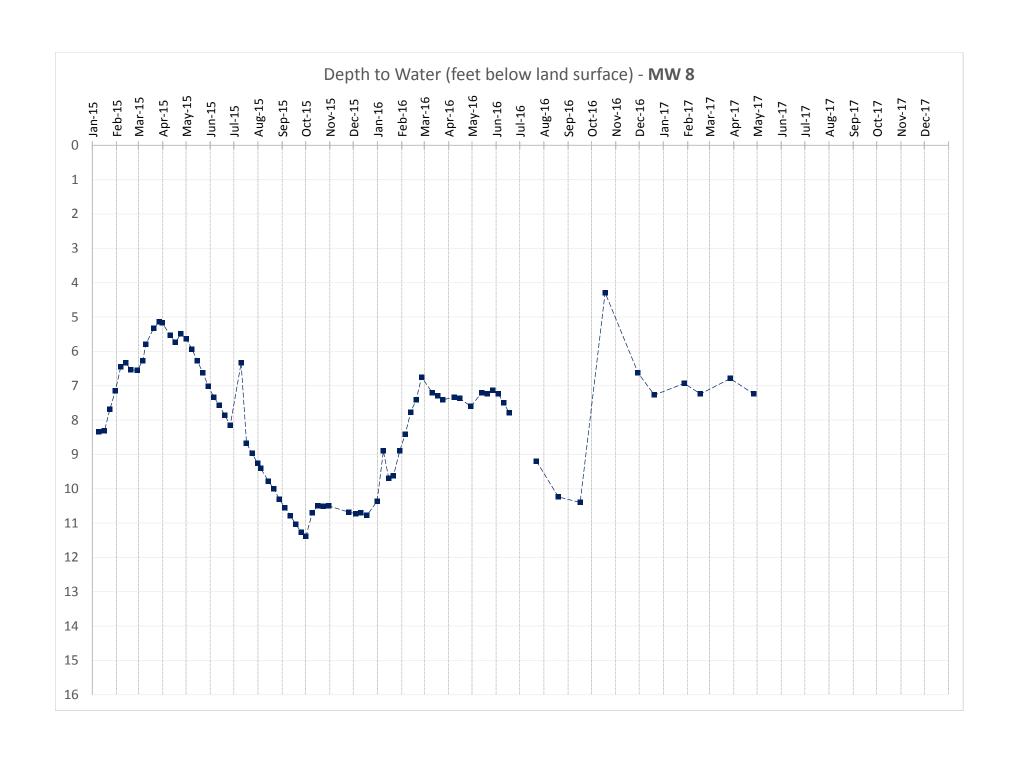
## Appendix 4 Water Level Data

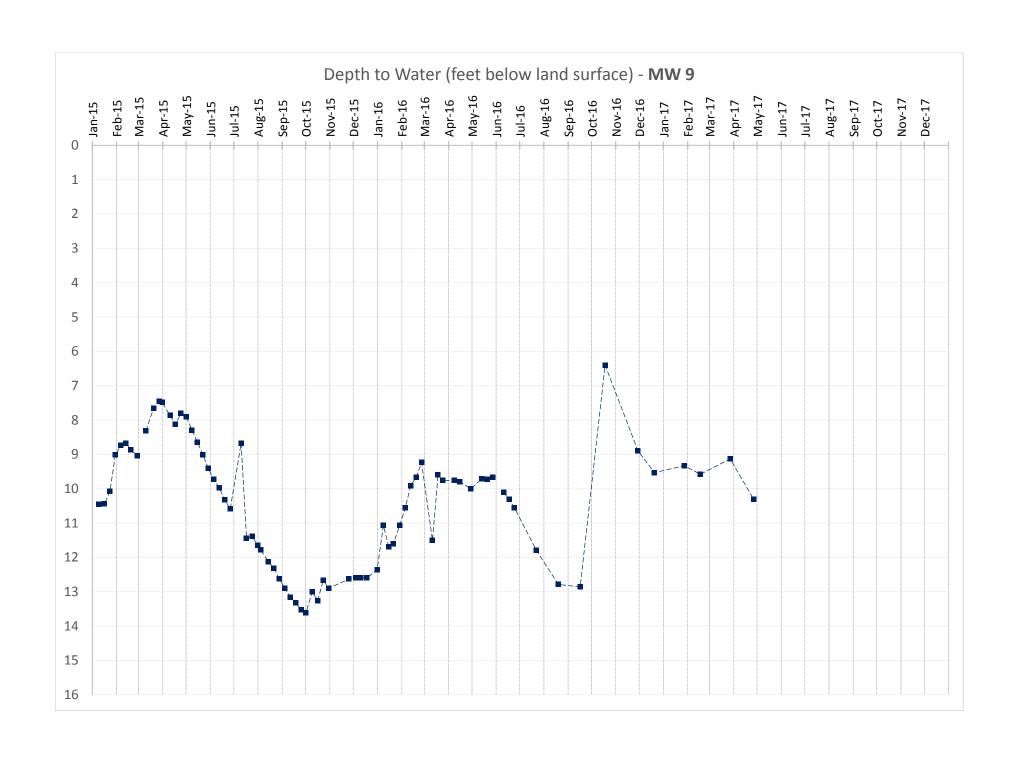












Sussex Cou	unty, DE									
	<u> </u>									
depth to wa	iter		ļ	ļ			<u> </u>			
(ft below to										
	<u> </u>	1/9/15	1/16/15	1/23/15	1/30/15	2/6/15	2/12/15	2/19/15	2/27/15	3/6/15
MW1		11.91	11.89	11.53	10.47	10.19	10.13	10.31	10.49	
MW2		11.76	11.81	11.42	10.63	10.49	10.44	10.65	10.78	10.61
MW3		14.21	14.27	13.99	13.12	12.86	12.81	12.94	13.06	
MW7		9.71	9.62	8.82	7.78	7.79	7.75	8.02	7.97	7.27
MW8		10.02	9.99	9.36	8.83	8.13	8.02	8.21	8.24	7.95
MW9		9.66	9.63	9.02	8.01	7.86	7.79	8.02	8.16	7.69
depth to wa	ater		l .	l			l			
(ft below la	nd)									
	pvc height	1/9/15	1/16/15	1/23/15	1/30/15	2/6/15	2/12/15	2/19/15	2/27/15	3/6/15
MW1	1.45	10.5	10.4	10.1	9.0	8.7	8.7	8.9	9.0	
MW2	1.64	10.1	10.2	9.8	9.0	8.9	8.8	9.0	9.1	9.0
MW3	1.41	12.8	12.9	12.6	11.7	11.5	11.4	11.5	11.7	
MW7	1.71	8.0	7.9	7.1	6.1	6.1	6.0	6.3	6.3	5.6
MW8	1.68	8.3	8.3	7.7	7.2	6.5	6.3	6.5	6.6	6.3
MW9	1.70	8.0	7.9	7.3	6.3	6.2	6.1	6.3	6.5	6.0
groundwate										
(ft above se	<del>, , , , , , , , , , , , , , , , , , , </del>									
	pvc elev	1/9/15	1/16/15	1/23/15	1/30/15	2/6/15	2/12/15	2/19/15	2/27/15	3/6/15
MW1	34.11	22.20	22.22	22.58	23.64	23.92	23.98	23.80	23.62	34.11
MW2	31.41	19.65	19.60	19.99	20.78	20.92	20.97	20.76	20.63	20.80
MW3	33.60	19.39	19.33	19.61	20.48	20.74	20.79	20.66	20.54	33.60
MW7	35.34	25.63	25.72	26.52	27.56	27.55	27.59	27.32	27.37	28.07
MW8	36.36	26.34	26.37	27.00	27.53	28.23	28.34	28.15	28.12	28.41
MW9	34.72	25.06	25.09	25.70	26.71	26.86	26.93	26.70	26.56	27.03

Sussex Cou	nty, DE									
depth to wa										
(ft below to	pvc)									
		3/10/15	3/20/15	3/27/15	3/31/15	4/10/15	4/17/15	4/24/15	5/1/15	5/8/15
MW1		9.76	9.11	8.91	8.94	9.32	9.58	9.25	9.36	9.74
MW2		10.51	10.48	9.64	9.68	10.03	10.23	9.84	9.97	10.31
MW3		12.51	11.97	11.84	11.85	12.17	12.37	12.11	12.11	12.61
MW7		6.91	6.59	6.45	6.51	7.01	7.14	6.62	7.11	7.51
MW8		7.47	7.01	6.82	6.85	7.21	7.42	7.16	7.32	7.62
MW9		7.25	6.76	6.67	6.62	7.02	7.22	6.79	7.11	7.45
depth to wa	ter									
(ft below lar	nd)									
	pvc height	3/10/15	3/20/15	3/27/15	3/31/15	4/10/15	4/17/15	4/24/15	5/1/15	5/8/15
MW1	1.45	8.3	7.7	7.5	7.5	7.9	8.1	7.8	7.9	8.3
MW2	1.64	8.9	8.8	8.0	8.0	8.4	8.6	8.2	8.3	8.7
MW3	1.41	11.1	10.6	10.4	10.4	10.8	11.0	10.7	10.7	11.2
MW7	1.71	5.2	4.9	4.7	4.8	5.3	5.4	4.9	5.4	5.8
MW8	1.68	5.8	5.3	5.1	5.2	5.5	5.7	5.5	5.6	5.9
MW9	1.70	5.6	5.1	5.0	4.9	5.3	5.5	5.1	5.4	5.8
groundwate	r elevation									
(ft above se	a level)									
-	pvc elev	3/10/15	3/20/15	3/27/15	3/31/15	4/10/15	4/17/15	4/24/15	5/1/15	5/8/15
MW1	34.11	24.35	25.00	25.20	25.17	24.79	24.53	24.86	24.75	24.37
MW2	31.41	20.90	20.93	21.77	21.73	21.38	21.18	21.57	21.44	21.10
MW3	33.60	21.09	21.63	21.76	21.75	21.43	21.23	21.49	21.49	20.99
MW7	35.34	28.43	28.75	28.89	28.83	28.33	28.20	28.72	28.23	27.83
MW8	36.36	28.89	29.35	29.54	29.51	29.15	28.94	29.20	29.04	28.74
MW9	34.72	27.47	27.96	28.05	28.10	27.70	27.50	27.93	27.61	27.27

Sussex Cou	nty, DE									
depth to wa										
(ft below to	pvc)									
		5/15/15	5/22/15	5/29/15	6/5/15	6/12/15	6/19/15	6/26/15	7/10/15	7/17/15
MW1		10.09	10.46	10.86	11.18	11.43	11.78	12.04	10.13	12.89
MW2		10.57	10.85	11.14	8.96	11.58	11.83	12.04	10.44	12.45
MW3		12.91	13.11	13.53	13.72	13.91	14.12	14.31	12.81	14.73
MW7		7.91	8.29	8.69	8.77	9.04	9.41	9.67	7.75	10.16
MW8		7.96	8.31	8.69	9.01	9.25	9.54	9.83	8.02	10.36
MW9		7.77	8.15	8.54	8.85	9.08	9.37	9.66	7.79	10.12
depth to wa										
(ft below lar										
	pvc height	5/15/15	5/22/15	5/29/15	6/5/15	6/12/15	6/19/15	6/26/15	7/10/15	7/17/15
MW1	1.45	8.6	9.0	9.4	9.7	10.0	10.3	10.6	8.7	11.4
MW2	1.64	8.9	9.2	9.5	7.3	9.9	10.2	10.4	8.8	10.8
MW3	1.41	11.5	11.7	12.1	12.3	12.5	12.7	12.9	11.4	13.3
MW7	1.71	6.2	6.6	7.0	7.1	7.3	7.7	8.0	6.0	8.5
MW8	1.68	6.3	6.6	7.0	7.3	7.6	7.9	8.2	6.3	8.7
MW9	1.70	6.1	6.5	6.8	7.2	7.4	7.7	8.0	6.1	8.4
groundwate	r elevation									
(ft above se	a level)									
	pvc elev	5/15/15	5/22/15	5/29/15	6/5/15	6/12/15	6/19/15	6/26/15	7/10/15	7/17/15
MW1	34.11	24.02	23.65	23.25	22.93	22.68	22.33	22.07	23.98	21.22
MW2	31.41	20.84	20.56	20.27	22.45	19.83	19.58	19.37	20.97	18.96
MW3	33.60	20.69	20.49	20.07	19.88	19.69	19.48	19.29	20.79	18.87
MW7	35.34	27.43	27.05	26.65	26.57	26.30	25.93	25.67	27.59	25.18
MW8	36.36	28.40	28.05	27.67	27.35	27.11	26.82	26.53	28.34	26.00
MW9	34.72	26.95	26.57	26.18	25.87	25.64	25.35	25.06	26.93	24.60

Sussex Cou	ınty, DE									
	<u> </u>									
depth to wa										
(ft below to	p pvc)									
		7/24/15	7/31/15	8/4/15	8/14/15	8/21/15	8/28/15	9/4/15	9/11/15	9/18/15
MW1		12.84	13.09	13.23	13.57	13.77	14.07	14.35	14.61	14.78
MW2		12.87	12.85	12.94	13.18	13.38	13.54	13.81	14.01	14.19
MW3		14.95	15.15	15.24	15.68	15.96	16.37	16.74	16.72	16.95
MW7		10.48	10.78	10.94	11.26	11.49	11.81	12.05	12.31	12.51
MW8		10.65	10.94	11.09	11.46	11.68	11.99	12.23	12.47	12.71
MW9		10.51	10.81	10.96	11.28	11.57	11.81	12.05	12.28	12.47
depth to wa	iter									
(ft below lai	nd)									
	pvc height	7/24/15	7/31/15	8/4/15	8/14/15	8/21/15	8/28/15	9/4/15	9/11/15	9/18/15
MW1	1.45	11.4	11.6	11.8	12.1	12.3	12.6	12.9	13.2	13.3
MW2	1.64	11.2	11.2	11.3	11.5	11.7	11.9	12.2	12.4	12.6
MW3	1.41	13.5	13.7	13.8	14.3	14.6	15.0	15.3	15.3	15.5
MW7	1.71	8.8	9.1	9.2	9.6	9.8	10.1	10.3	10.6	10.8
MW8	1.68	9.0	9.3	9.4	9.8	10.0	10.3	10.6	10.8	11.0
MW9	1.70	8.8	9.1	9.3	9.6	9.9	10.1	10.4	10.6	10.8
groundwate	er elevation									
(ft above se	a level)									
-	pvc elev	7/24/15	7/31/15	8/4/15	8/14/15	8/21/15	8/28/15	9/4/15	9/11/15	9/18/15
MW1	34.11	21.27	21.02	20.88	20.54	20.34	20.04	19.76	19.50	19.33
MW2	31.41	18.54	18.56	18.47	18.23	18.03	17.87	17.60	17.40	17.22
MW3	33.60	18.65	18.45	18.36	17.92	17.64	17.23	16.86	16.88	16.65
MW7	35.34	24.86	24.56	24.40	24.08	23.85	23.53	23.29	23.03	22.83
MW8	36.36	25.71	25.42	25.27	24.90	24.68	24.37	24.13	23.89	23.65
MW9	34.72	24.21	23.91	23.76	23.44	23.15	22.91	22.67	22.44	22.25

Sussex Cou	inty, DE									
dently to your	(									
depth to wa										
(ft below to	p pvc)	0/05/45	40/4/45	40/0/45	40/40/45	10/00/15	40/00/45	44/05/45	40/4/45	10/10/15
		9/25/15	10/1/15	10/9/15	10/16/15	10/23/15	10/30/15	11/25/15	12/4/15	12/10/15
MW1		14.97	15.06	14.45	14.71	14.11	14.35	14.08	14.05	14.04
MW2		14.29	14.34	13.59	13.76	13.46	13.56	13.41	13.38	13.33
MW3		16.88	16.92	16.21	15.95	15.92	15.93	15.86	15.83	15.83
MW7		12.75	12.86	11.73	11.74	11.87	11.89	11.38	12.05	12.02
MW8		12.95	13.07	12.38	12.17	12.19	12.18	12.36	12.41	12.38
MW9		12.71	12.83	11.69	11.84	11.84	11.99	11.98	12.01	11.97
depth to wa	<u> </u> ter									
(ft below lar										
(**************************************	pvc height	9/25/15	10/1/15	10/9/15	10/16/15	10/23/15	10/30/15	11/25/15	12/4/15	12/10/15
MW1	1.45	13.5	13.6	13.0	13.3	12.7	12.9	12.6	12.6	12.6
MW2	1.64	12.7	12.7	12.0	12.1	11.8	11.9	11.8	11.7	11.7
MW3	1.41	15.5	15.5	14.8	14.5	14.5	14.5	14.5	14.4	14.4
MW7	1.71	11.0	11.2	10.0	10.0	10.2	10.2	9.7	10.3	10.3
MW8	1.68	11.3	11.4	10.7	10.5	10.5	10.5	10.7	10.7	10.7
MW9	1.70	11.0	11.1	10.0	10.1	10.1	10.3	10.3	10.3	10.3
groundwate										
(ft above se	· · · · · · · · · · · · · · · · · · ·	0/05/45	40/4/45	40/0/45	40/46/45	40/00/45	40/20/45	44/05/45	40/4/45	40/40/45
N 4\ A / 4	pvc elev	9/25/15	10/1/15	10/9/15	10/16/15	10/23/15	10/30/15	11/25/15	12/4/15	12/10/15
MW1	34.11	19.14	19.05	19.66	19.40	20.00	19.76	20.03	20.06	20.07
MW2	31.41	17.12	17.07	17.82	17.65	17.95	17.85	18.00	18.03	18.08
MW3	33.60	16.72	16.68	17.39	17.65	17.68	17.67	17.74	17.77	17.77
MW7	35.34	22.59	22.48	23.61	23.60	23.47	23.45	23.96	23.29	23.32
MW8	36.36	23.41	23.29	23.98	24.19	24.17	24.18	24.00	23.95	23.98
MW9	34.72	22.01	21.89	23.03	22.88	22.88	22.73	22.74	22.71	22.75

Sussex Cou	nty, DE									
depth to wa										
(ft below to	p pvc)									
		12/18/15	12/31/15	1/8/16	1/15/16	1/21/16	1/29/16	2/5/16	2/12/16	2/19/16
MW1		14.05	13.81	12.52	13.14	13.05	12.52	12.01	11.36	11.11
MW2		13.37	13.11	12.06	12.55	12.51	12.06	11.68	11.21	11.04
MW3		15.86	15.24	14.61	15.06	15.01	14.61	14.16	13.38	13.45
MW7		12.11	11.46	10.08	11.05	10.89	10.08	9.76	9.03	8.53
MW8		12.46	12.04	10.58	11.38	11.31	10.58	10.09	9.45	9.09
MW9		12.06	11.44	10.15	10.96	10.89	10.15	9.71	9.09	8.77
depth to wa	ter									
(ft below lar										
(It below lai	pvc height	12/18/15	12/31/15	1/8/16	1/15/16	1/21/16	1/29/16	2/5/16	2/12/16	2/19/16
MW1	1.45	12.6	12.4	11.1	11.7	11.6	11.1	10.6	9.9	9.7
MW2	1.64	11.7	11.5	10.4	10.9	10.9	10.4	10.0	9.6	9.4
MW3	1.41	14.5	13.8	13.2	13.7	13.6	13.2	12.8	12.0	12.0
MW7	1.71	10.4	9.8	8.4	9.3	9.2	8.4	8.1	7.3	6.8
MW8	1.68	10.8	10.4	8.9	9.7	9.6	8.9	8.4	7.8	7.4
MW9	1.70	10.4	9.7	8.5	9.3	9.2	8.5	8.0	7.4	7.1
groundwate	r elevation									
(ft above se	a level)									
	pvc elev	12/18/15	12/31/15	1/8/16	1/15/16	1/21/16	1/29/16	2/5/16	2/12/16	2/19/16
MW1	34.11	20.06	20.30	21.59	20.97	21.06	21.59	22.10	22.75	23.00
MW2	31.41	18.04	18.30	19.35	18.86	18.90	19.35	19.73	20.20	20.37
MW3	33.60	17.74	18.36	18.99	18.54	18.59	18.99	19.44	20.22	20.15
MW7	35.34	23.23	23.88	25.26	24.29	24.45	25.26	25.58	26.31	26.81
MW8	36.36	23.90	24.32	25.78	24.98	25.05	25.78	26.27	26.91	27.27
MW9	34.72	22.66	23.28	24.57	23.76	23.83	24.57	25.01	25.63	25.95

Sussex Cou	inty, DE									
depth to wa	tor									
(ft below to										
(it below to	J pvc)	2/26/16	3/11/16	3/18/16	3/24/16	4/8/16	4/15/16	4/29/16	5/13/16	5/20/16
MW1		10.69	12.95	11.05	11.21	11.21	11.25	11.45	11.16	11.17
MW2		10.79	11.02	11.12	11.25	11.26	11.27	11.44	11.21	11.22
MW3		13.17	13.31	13.42	13.56	13.56	13.58	13.75	13.53	13.54
MW7		8.49	8.71	8.76	8.89	8.67	8.77	9.08	8.46	8.71
MW8		8.43	8.89	8.98	9.09	9.01	9.05	9.28	8.88	8.92
MW9		8.46	8.66	8.76	8.88	8.73	8.83	9.09	8.67	8.74
depth to wa	tor									
(ft below lar										
(It below lai	pvc height	2/26/16	3/11/16	3/18/16	3/24/16	4/8/16	4/15/16	4/29/16	5/13/16	5/20/16
MW1	1.45	9.2	11.5	9.6	9.8	9.8	9.8	10.0	9.7	9.7
MW2	1.64	9.2	9.4	9.5	9.6	9.6	9.6	9.8	9.6	9.6
MW3	1.41	11.8	11.9	12.0	12.2	12.2	12.2	12.3	12.1	12.1
MW7	1.71	6.8	7.0	7.1	7.2	7.0	7.1	7.4	6.8	7.0
MW8	1.68	6.8	7.2	7.3	7.4	7.3	7.4	7.6	7.2	7.2
MW9	1.70	6.8	7.0	7.1	7.2	7.0	7.1	7.4	7.0	7.0
groundwate	r elevation									
(ft above se	a level)									
	pvc elev	2/26/16	3/11/16	3/18/16	3/24/16	4/8/16	4/15/16	4/29/16	5/13/16	5/20/16
MW1	34.11	23.42	21.16	23.06	22.90	22.90	22.86	22.66	22.95	22.94
MW2	31.41	20.62	20.39	20.29	20.16	20.15	20.14	19.97	20.20	20.19
MW3	33.60	20.43	20.29	20.18	20.04	20.04	20.02	19.85	20.07	20.06
MW7	35.34	26.85	26.63	26.58	26.45	26.67	26.57	26.26	26.88	26.63
MW8	36.36	27.93	27.47	27.38	27.27	27.35	27.31	27.08	27.48	27.44
MW9	34.72	26.26	26.06	25.96	25.84	25.99	25.89	25.63	26.05	25.98

Sussex Cou	nty, DE									
donth to we	40.0									
depth to wa										
(ft below to	b pvc)	5/27/16	6/3/16	6/10/16	6/17/16	6/24/16	7/22/16	8/19/16	9/16/16	10/18/16
MW1		11.11	0/3/10	11.56	11.76	12.01	13.25	14.24	14.31	7.85
MW2		11.23	11.31	11.50	11.76	11.97	12.91	13.71	13.76	8.69
MW3			11.31							
		13.51	0.50	13.85	14.07	14.32	15.58	16.28	16.51	10.61
MW7		8.51	8.52	9.07	9.35		10.79	11.76	11.91	5.61
MW8		8.81	8.92	9.18	9.47		10.88	11.92	12.08	5.97
MW9		8.58	8.71	9.01	9.33		10.81	11.81	11.93	5.67
depth to wa	l ter									
(ft below lar	nd)									
	pvc height	5/27/16	6/3/16	6/10/16	6/17/16	6/24/16	7/22/16	8/19/16	9/16/16	10/18/16
MW1	1.45	9.7		10.1	10.3	10.6	11.8	12.8	12.9	6.4
MW2	1.64	9.6	9.7	9.9	10.1	10.3	11.3	12.1	12.1	7.1
MW3	1.41	12.1		12.4	12.7	12.9	14.2	14.9	15.1	9.2
MW7	1.71	6.8	6.8	7.4	7.6		9.1	10.1	10.2	3.9
MW8	1.68	7.1	7.2	7.5	7.8		9.2	10.2	10.4	4.3
MW9	1.70	6.9	7.0	7.3	7.6		9.1	10.1	10.2	4.0
groundwate										
(ft above se										
	pvc elev	5/27/16	6/3/16	6/10/16	6/17/16	6/24/16	7/22/16	8/19/16	9/16/16	10/18/16
MW1	34.11	23.00	34.11	22.55	22.35	22.10	20.86	19.87	19.80	26.26
MW2	31.41	20.18	20.10	19.90	19.72	19.44	18.50	17.70	17.65	22.72
MW3	33.60	20.09	33.60	19.75	19.53	19.28	18.02	17.32	17.09	22.99
MW7	35.34	26.83	26.82	26.27	25.99	35.34	24.55	23.58	23.43	29.73
MW8	36.36	27.55	27.44	27.18	26.89	36.36	25.48	24.44	24.28	30.39
MW9	34.72	26.14	26.01	25.71	25.39	34.72	23.91	22.91	22.79	29.05

Sussex Co	ounty, DE						
depth to w	ater						
(ft below to	op pvc)						
		11/29/16	12/20/16	1/27/17	2/17/17	3/27/17	4/26/17
MW1		10.35	10.98	10.78	11.03	10.58	11.76
MW2		10.12	11.42	11.16	11.32	10.88	9.43
MW3		12.78	13.43	13.36	13.54	13.12	14.01
MW7		8.21	8.61	8.17	8.69	8.22	8.85
MW8		8.31	8.95	8.61	8.92	8.47	8.92
MW9		8.12	9.69	8.32	8.69	8.21	8.76
depth to w							
(ft below la							
	pvc height	11/29/16	12/20/16	1/27/17	2/17/17	3/27/17	4/26/17
MW1	1.45	8.9	9.5	9.3	9.6	9.1	10.3
MW2	1.64	8.5	9.8	9.5	9.7	9.2	7.8
MW3	1.41	11.4	12.0	12.0	12.1	11.7	12.6
MW7	1.71	6.5	6.9	6.5	7.0	6.5	7.1
MW8	1.68	6.6	7.3	6.9	7.2	6.8	7.2
MW9	1.70	6.4	8.0	6.6	7.0	6.5	7.1
	ter elevation						
(ft above s							
	pvc elev	11/29/16	12/20/16	1/27/17	2/17/17	3/27/17	4/26/17
MW1	34.11	23.76	23.13	23.33	23.08	23.53	22.35
MW2	31.41	21.29	19.99	20.25	20.09	20.53	21.98
MW3	33.60	20.82	20.17	20.24	20.06	20.48	19.59
MW7	35.34	27.13	26.73	27.17	26.65	27.12	26.49
MW8	36.36	28.05	27.41	27.75	27.44	27.89	27.44
MW9	34.72	26.60	25.03	26.40	26.03	26.51	25.96

# Appendix 5 Aquifer Test Data

#### **Aquifer Test Calculations**

T = 264 Q/ds

Where Q is the flow rate in gallons per minute (gpm)

and ds is the drawdown (feet) per log cycle of time

Based on the straight-line part of the observation well semilog graph of drawdown vs. time, extending from approximately 7 to 700 elapsed minutes,

ds = 1.32 feet - 1.25 feet = 0.07 foot

T = (264)(101.8 gpm) / (0.07 ft) = 380,000 gallons per day per foot

Sand above confining layer = 100 feet thick determined by geophysical logging at well DW-1

Static water level in unconfined aquifer = approximately 8 feet deep

Saturated thickness = 100 feet - 8 feet = 92 feet

Hydraulic Conductivity (K) = transmissivity / (aquifer thickness)

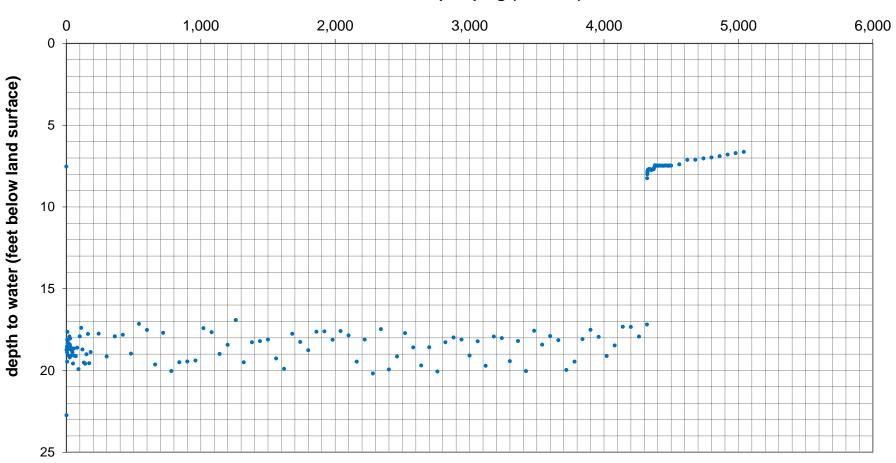
K = [(380,000 gallons per day per foot) / (7.48 gallons/cubic foot)] / 92 feet

T = (51,000 square feet/day) / 92 feet

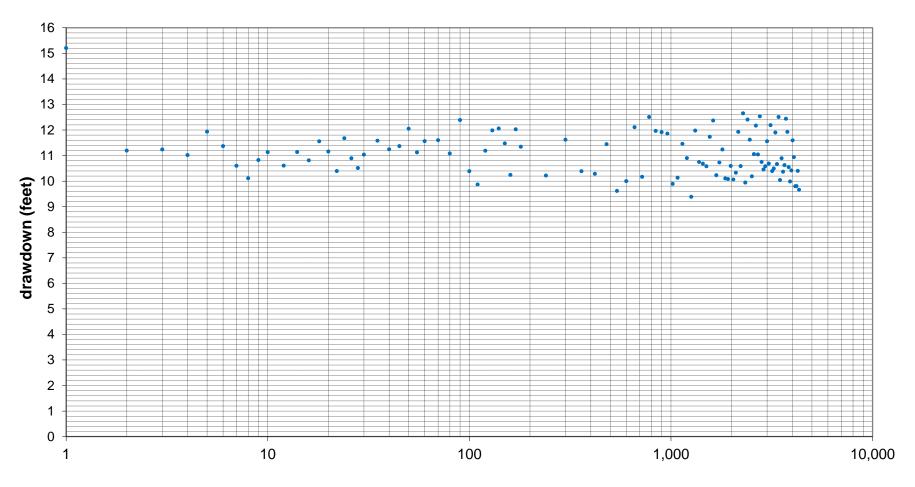
K = 550 feet/day

#### Depth to Water in Pumped Well DW-1 Aquifer Test at Sussex County, DE Inland Bays site started on June 19, 2017

#### time since start of pumping (minutes)

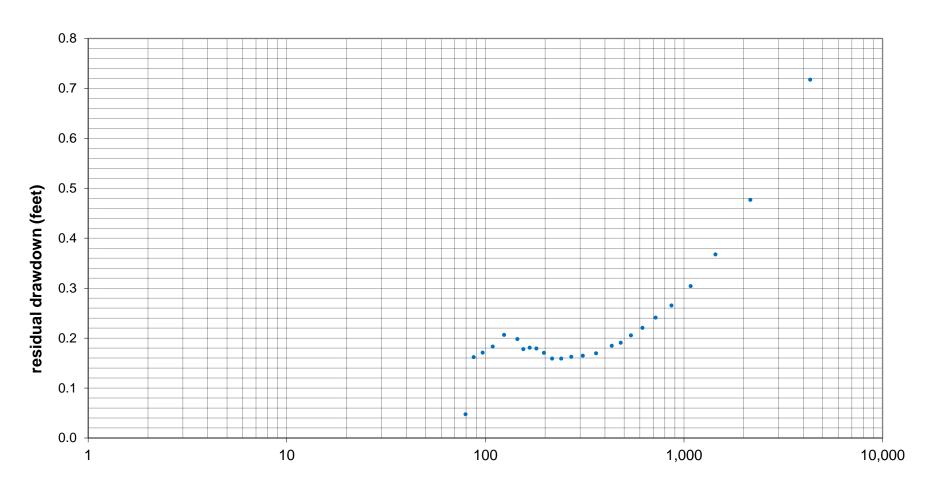


### Drawdown in Pumped Well DW-1 Aquifer Test at Sussex County, DE, Inland Bays site started on June 19, 2017



time since start of pumping (minutes)

#### Residual Drawdown in Pumped Well DW-1 Aquifer Test at Sussex County, DE Inland Bays site started on June 19, 2017



t / t' = (time since started pumping / time since stopped pumping)

	Aquifer Test Data from Pumped Well DW-1 Inland Bays Regional Wastewater Facilities in Sussex County, DE										
	start date: June 19, 2017 Data from: Somerset Well Drilling										
static water level = 7.53 feet below land surface Flow = 101.8 gpm											
t = time since pumping started (minutes)											
d = depth to water below land surface (feet)											
t' = time since pumping stopped (minutes) s = drawdown (feet) = d - static s' = residual drawdown (feet) = d - static											
s = drawdov	vn (feet) = d	- static s	s' = residual	drawdown	(feet) = d - sta	tic					
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>					
0	7.53	0.00				pumping					
1	22.74	15.21				pumping					
2	18.72	11.19				pumping					
3	18.77	11.24				pumping					
4	18.55	11.02				pumping					
5	19.46	11.93				pumping					
6	18.90	11.37				pumping					
7	18.13	10.60				pumping					
8	17.64	10.11				pumping					
9	18.35	10.82				pumping					
10	18.66	11.13				pumping					
12	18.13	10.60				pumping					
14	18.67	11.14				pumping					
16	18.34	10.81				pumping					
18	19.09	11.56				pumping					
20	18.69	11.16				pumping					
22	17.92	10.39				pumping					
24	19.20	11.67				pumping					
26	18.42	10.89				pumping					
28	18.04	10.51				pumping					
30	18.57	11.04				pumping					
35	19.11	11.58				pumping					
40	18.77	11.24				pumping					
45	18.90	11.37				pumping					
50	19.58	12.05				pumping					
55	18.66	11.13				pumping					
60	19.10	11.57				pumping					
70	19.13	11.60				pumping					
80	18.61	11.08				pumping					
90	19.92	12.39				pumping					
100	17.92	10.39				pumping					
110	17.39	9.86				pumping					
120	18.71	11.18				pumping					
130	19.52	11.99				pumping					
140	19.59	12.06				pumping					
150	19.01	11.48				pumping					
160	17.77	10.24				pumping					
170	19.56	12.03				pumping					
180	18.87	11.34				pumping					

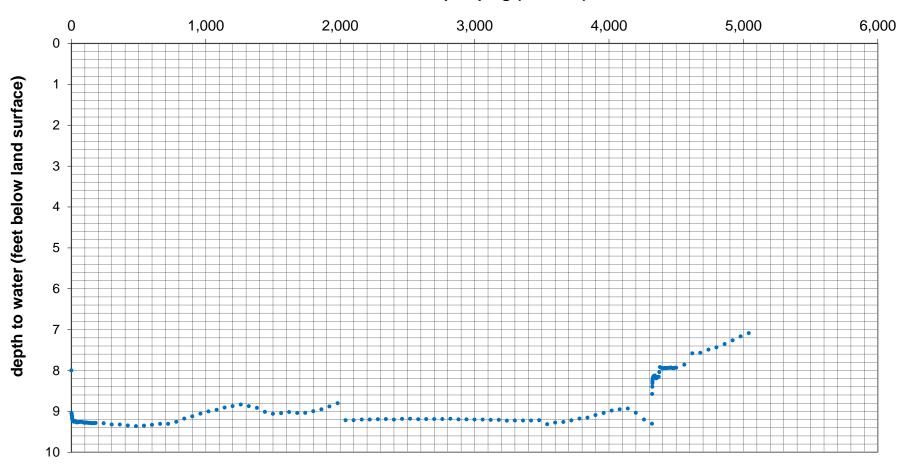
	Aquifer Test Data from Pumped Well DW-1										
	Inland Bays Regional Wastewater Facilities in Sussex County, DE										
	start date: June 19, 2017 Data from: Somerset Well Drilling										
static water level = 7.53 feet below land surface Flow = 101.8 gpm											
t = time since pumping started (minutes)											
d = depth to water below land surface (feet)											
t' = time since pumping stopped (minutes)											
s = drawdov	vn (feet) = d	- static s	' = residual	drawdown	(feet) = d - sta	tic					
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>					
240	17.75	10.22				pumping					
300	19.15	11.62				pumping					
360	17.92	10.39				pumping					
420	17.81	10.28				pumping					
480	18.97	11.44				pumping					
540	17.15	9.62				pumping					
600	17.52	9.99				pumping					
660	19.64	12.11				pumping					
720	17.70	10.17				pumping					
780	20.04	12.51				pumping					
840	19.50	11.97				pumping					
900	19.45	11.92				pumping					
960	19.39	11.86				pumping					
1,020	17.42	9.89				pumping					
1,080	17.66	10.13				pumping					
1,140	18.99	11.46				pumping					
1,200	18.43	10.90				pumping					
1,260	16.91	9.38				pumping					
1,320	19.50	11.97				pumping					
1,380	18.28	10.75				pumping					
1,440	18.21	10.68				pumping					
1,500	18.11	10.58				pumping					
1,560	19.26	11.73				pumping					
1,620	19.90	12.37				pumping					
1,680	17.76	10.23				pumping					
1,740	18.26	10.73				pumping					
1,800	18.77	11.24				pumping					
1,860	17.63	10.10				pumping					
1,920	17.61	10.08				pumping					
1,980	18.12	10.59				pumping					
2,040	17.59	10.06				pumping					
2,100	17.86	10.33				pumping					
2,160	19.46	11.93				pumping					
2,220	18.11	10.58				pumping					
2,280	20.18	12.65				pumping					
2,340	17.47	9.94				pumping					
2,400	19.94	12.41				pumping					
2,460	19.15	11.62				pumping					
2,520	17.71	10.18				pumping					

Aquifer Test Data from Pumped Well DW-1											
Inland Bays				Sussex Cour	nty, DE						
	June 19, 201				nerset Well D	rillina					
	static water level = 7.53 feet below land surface Flow = 101.8 gpm										
t = time since pumping started (minutes)											
d = depth to water below land surface (feet)											
t' = time since pumping stopped (minutes)											
s = drawdown (feet) = d - static s' = residual drawdown (feet) = d - static											
<u>t</u>	<u>d</u>	s	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	phase					
2,580	18.59	11.06	_			pumping					
2,640	19.70	12.17				pumping					
2,700	18.58	11.05				pumping					
2,760	20.07	12.54				pumping					
2,820	18.28	10.75				pumping					
2,880	17.98	10.45				pumping					
2,940	18.11	10.58				pumping					
3,000	19.09	11.56				pumping					
3,060	18.21	10.68				pumping					
3,120	19.72	12.19				pumping					
3,180	17.92	10.39				pumping					
3,240	18.02	10.49				pumping					
3,300	19.43	11.90				pumping					
3,360	18.20	10.67				pumping					
3,420	20.04	12.51				pumping					
3,480	17.57	10.04				pumping					
3,540	18.42	10.89				pumping					
3,600	17.90	10.37				pumping					
3,660	18.15	10.62				pumping					
3,720	19.97	12.44				pumping					
3,780	19.46	11.93				pumping					
3,840	18.08	10.55				pumping					
3,900	17.52	9.99				pumping					
3,960	17.95	10.42				pumping					
4,020	19.12	11.59				pumping					
4,080	18.47	10.94				pumping					
4,140	17.33	9.80				pumping					
4,200	17.33	9.80				pumping					
4,260	17.93	10.40				pumping					
4,320	17.19	9.66				pumping					
4,321	8.25		1	0.72	4321.0	recovery					
4,322	8.01		2	0.48	2161.0	recovery					
4,323	7.90		3	0.37	1441.0	recovery					
4,324	7.83		4	0.30	1081.0	recovery					
4,325	7.80		5	0.27	865.0	recovery					
4,326	7.77		6	0.24	721.0	recovery					
4,327	7.75		7	0.22	618.1	recovery					
4,328	7.74		8	0.21	541.0	recovery					
4,329	7.72		9	0.19	481.0	recovery					

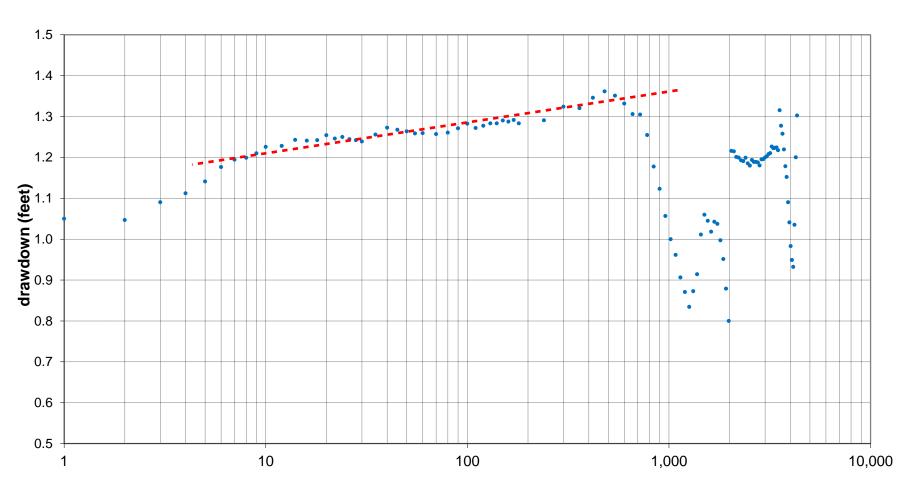
Aquifer Tes	t Data from F	Pumped Wel	I DW-1								
	Regional W										
	start date: June 19, 2017 Data from: Somerset Well Drilling										
static water level = 7.53 feet below land surface Flow = 101.8 gpm											
t = time since pumping started (minutes)											
d = depth to water below land surface (feet)											
t' = time since pumping stopped (minutes) s = drawdown (feet) = d - static s' = residual drawdown (feet) = d - static											
S = drawdov											
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>					
4,330	7.71		10	0.18	433.0	recovery					
4,332	7.70		12	0.17	361.0	recovery					
4,334	7.69		14	0.16	309.6	recovery					
4,336	7.69		16	0.16	271.0	recovery					
4,338	7.69		18	0.16	241.0	recovery					
4,340 4,342	7.69 7.70		20 22	0.16 0.17	217.0	recovery					
4,342	7.70		24	0.17	197.4 181.0	recovery					
4,344	7.71		26	0.18	167.2	recovery recovery					
4,348	7.71		28	0.18	155.3	-					
4,350	7.71		30	0.10	145.0	recovery					
4,355	7.74		35	0.21	124.4	recovery					
4,360	7.71		40	0.18	109.0	recovery					
4,365	7.70		45	0.17	97.0	recovery					
4,370	7.69		50	0.16	87.4	recovery					
4,375	7.58		55	0.05	79.5	recovery					
4,380	7.46		60	-0.07	73.0	recovery					
4,390	7.47		70	-0.06	62.7	recovery					
4,400	7.48		80	-0.05	55.0	recovery					
4,410	7.48		90	-0.05	49.0	recovery					
4,420	7.48		100	-0.05	44.2	recovery					
4,430	7.47		110	-0.06	40.3	recovery					
4,440	7.48		120	-0.05	37.0	recovery					
4,450	7.47		130	-0.06	34.2	recovery					
4,460	7.47		140	-0.06	31.9	recovery					
4,470	7.48		150	-0.05	29.8	recovery					
4,480	7.48		160	-0.05	28.0	recovery					
4,490	7.47		170	-0.06	26.4	recovery					
4,500	7.47		180	-0.06	25.0	recovery					
4,560	7.40		240	-0.13	19.0	recovery					
4,620	7.12		300	-0.41	15.4	recovery					
4,680 4,740	7.11		360 420	-0.42	13.0	recovery					
4,740	7.03 6.97		420 480	-0.50 -0.56	11.3 10.0	recovery					
4,860	6.89		540	-0.64	9.0	recovery					
4,800	6.80		600	-0.64	8.2	recovery					
4,980	6.71		660	-0.73	7.5	recovery					
5,040	6.63		720	-0.90	7.0	recovery					
0,040	0.05		,20	0.90	7.0	TOUVELY					

#### Depth to Water in Observation Well DW-2 Aquifer Test at Sussex County, DE Inland Bays site started on June 19, 2017

#### time since start of pumping (minutes)

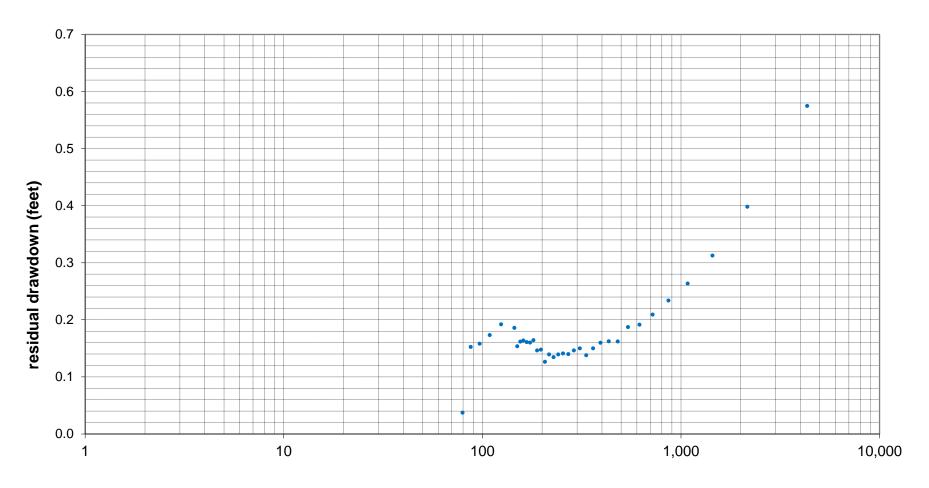


### Drawdown in Observation Well DW-2 Aquifer Test at Sussex County, DE, Inland Bays site started on June 19, 2017



time since start of pumping (minutes)

### Residual Drawdown in Observation Well DW-2 Aquifer Test at Sussex County, DE Inland Bays site started on June 19, 2017



t / t' = (time since started pumping / time since stopped pumping)

Aquifer Test Data from Observation Well DW-2							
	Regional W						
	start date: June 19, 2017 Data from: Somerset Well Drilling						
	level = 8.00						
	e pumping s	1					
•	water below		. ,				
	ce pumping	<del></del>		droudour	(foot) _ d _ ota	410	
s = drawdov	vn (feet) = d	- Static S	= residuai	arawaown	(feet) = d - sta	tic	
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>	
0	8.00	0.00				pumping	
1	9.05	1.05				pumping	
2	9.05	1.05				pumping	
3	9.09	1.09				pumping	
4	9.11	1.11				pumping	
5	9.14	1.14				pumping	
6	9.18	1.18				pumping	
7	9.19	1.19				pumping	
8	9.20	1.20				pumping	
9	9.21	1.21				pumping	
10	9.23	1.23				pumping	
12	9.23	1.23				pumping	
14	9.24	1.24				pumping	
16	9.24	1.24				pumping	
18	9.24	1.24				pumping	
20	9.25	1.25				pumping	
22	9.25	1.25				pumping	
24	9.25	1.25				pumping	
26	9.24	1.24				pumping	
28	9.24	1.24				pumping	
30	9.24	1.24				pumping	
35	9.26	1.26				pumping	
40	9.27	1.27				pumping	
45	9.27	1.27				pumping	
50	9.26	1.26				pumping	
55	9.26	1.26				pumping	
60	9.26	1.26				pumping	
70	9.26	1.26				pumping	
80	9.26	1.26				pumping	
90	9.27	1.27				pumping	
100	9.28	1.28				pumping	
110	9.27	1.27				pumping	
120	9.28	1.28				pumping	
130	9.28	1.28				pumping	
140	9.28	1.28				pumping	
150	9.29	1.29				pumping	
160	9.29	1.29				pumping	
170	9.29	1.29				pumping	
180	9.28	1.28				pumping	

	Aquifer Test Data from Observation Well DW-2						
	Regional W						
	start date: June 19, 2017 Data from: Somerset Well Drilling						
	level = 8.00						
t = time sinc							
	water below						
	ce pumping	<del></del>		drawdawa	(foot) _ d _ ota		
S = drawdov	vn (feet) = d	- Static S	= residuai	arawaown	(feet) = d - sta	ITIC	
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>	
240	9.29	1.29				pumping	
300	9.32	1.32				pumping	
360	9.32	1.32				pumping	
420	9.35	1.35				pumping	
480	9.36	1.36				pumping	
540	9.35	1.35				pumping	
600	9.33	1.33				pumping	
660	9.31	1.31				pumping	
720	9.30	1.30				pumping	
780	9.25	1.25				pumping	
840	9.18	1.18				pumping	
900	9.12	1.12				pumping	
960	9.06	1.06				pumping	
1,020	9.00	1.00				pumping	
1,080	8.96	0.96				pumping	
1,140	8.91	0.91				pumping	
1,200	8.87	0.87				pumping	
1,260	8.83	0.83				pumping	
1,320	8.87	0.87				pumping	
1,380	8.91	0.91				pumping	
1,440	9.01	1.01				pumping	
1,500	9.06	1.06				pumping	
1,560	9.04	1.04				pumping	
1,620	9.02	1.02				pumping	
1,680	9.04	1.04				pumping	
1,740	9.04	1.04				pumping	
1,800	9.00	1.00				pumping	
1,860	8.95	0.95				pumping	
1,920	8.88	0.88				pumping	
1,980	8.80	0.80				pumping	
2,040	9.22	1.22				pumping	
2,100	9.21	1.21				pumping	
2,160	9.20	1.20				pumping	
2,220	9.20	1.20				pumping	
2,280	9.19	1.19				pumping	
2,340	9.19	1.19				pumping	
2,400	9.20	1.20				pumping	
2,460	9.19	1.19				pumping	
2,520	9.18	1.18				pumping	

	Aquifer Test Data from Observation Well DW-2						
-	Inland Bays Regional Wastewater Facilities in Sussex County, DE						
	June 19, 201			a from: Sor	merset Well D	rilling	
static water							
t = time sinc							
d = depth to			, ,				
t' = time sind					(f = -1)   1   -1 =	4* -	
s = drawdov	vn (teet) = a	- static s	s' = residuai	arawaown	(feet) = d - sta	itic	
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>	
2,580	9.19	1.19				pumping	
2,640	9.19	1.19				pumping	
2,700	9.19	1.19				pumping	
2,760	9.19	1.19				pumping	
2,820	9.18	1.18				pumping	
2,880	9.20	1.20				pumping	
2,940	9.20	1.20				pumping	
3,000	9.20	1.20				pumping	
3,060	9.20	1.20				pumping	
3,120	9.21	1.21				pumping	
3,180	9.21	1.21				pumping	
3,240	9.23	1.23				pumping	
3,300	9.22	1.22				pumping	
3,360	9.22	1.22				pumping	
3,420	9.22	1.22				pumping	
3,480	9.22	1.22				pumping	
3,540	9.32	1.32				pumping	
3,600	9.28	1.28				pumping	
3,660	9.26	1.26				pumping	
3,720	9.22	1.22				pumping	
3,780	9.18	1.18				pumping	
3,840	9.15	1.15				pumping	
3,900	9.09	1.09				pumping	
3,960	9.04	1.04				pumping	
4,020	8.98	0.98				pumping	
4,080	8.95	0.95				pumping	
4,140	8.93	0.93				pumping	
4,200	9.04	1.04				pumping	
4,260	9.20	1.20				pumping	
4,320	9.30	1.30				pumping	
4,321	8.57		1	0.57	4321.0	recovery	
4,322	8.40		2	0.40	2161.0	recovery	
4,323	8.31		3	0.31	1441.0	recovery	
4,324	8.26		4	0.26	1081.0	recovery	
4,325	8.23		5	0.23	865.0	recovery	
4,326	8.21		6	0.21	721.0	recovery	
4,327	8.19		7	0.19	618.1	recovery	
4,328	8.19		8	0.19	541.0	recovery	
4,329	8.16		9	0.16	481.0	recovery	

	Aquifer Test Data from Observation Well DW-2						
	Regional W						
	June 19, 201				merset Well D	rilling	
	level = 8.00						
	e pumping s						
-	water below		. ,				
	ce pumping			droudour	(foot) _ d _ oto	410	
s = drawdov	vn (feet) = d	- Static S	= residuai	arawaown	(feet) = d - sta	ITIC	
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	<u>phase</u>	
4,330	8.16		10	0.16	433.0	recovery	
4,331	8.16		11	0.16	393.7	recovery	
4,332	8.15		12	0.15	361.0	recovery	
4,333	8.14		13	0.14	333.3	recovery	
4,334	8.15		14	0.15	309.6	recovery	
4,335	8.15		15	0.15	289.0	recovery	
4,336	8.14		16	0.14	271.0	recovery	
4,337	8.14		17	0.14	255.1	recovery	
4,338	8.14		18	0.14	241.0	recovery	
4,339	8.13		19	0.13	228.4	recovery	
4,340	8.14		20	0.14	217.0	recovery	
4,341	8.13		21	0.13	206.7	recovery	
4,342	8.15		22	0.15	197.4	recovery	
4,343	8.15		23	0.15	188.8	recovery	
4,344	8.16		24	0.16	181.0	recovery	
4,345	8.16		25	0.16	173.8	recovery	
4,346	8.16		26	0.16	167.2	recovery	
4,347	8.16		27	0.16	161.0	recovery	
4,348	8.16		28	0.16	155.3	recovery	
4,349	8.15		29	0.15	150.0	recovery	
4,350	8.19		30	0.19	145.0	recovery	
4,355	8.19		35	0.19	124.4	recovery	
4,360	8.17		40	0.17	109.0	recovery	
4,365	8.16		45	0.16	97.0	recovery	
4,370	8.15		50	0.15	87.4	recovery	
4,375	8.04		55	0.04	79.5	recovery	
4,380	7.92		60	-0.08	73.0	recovery	
4,390	7.93		70	-0.07	62.7	recovery	
4,400	7.95		80	-0.05	55.0	recovery	
4,410	7.94		90	-0.06	49.0	recovery	
4,420	7.94		100	-0.06	44.2	recovery	
4,430	7.94		110	-0.06	40.3	recovery	
4,440	7.94		120	-0.06	37.0	recovery	
4,450	7.94		130	-0.06	34.2	recovery	
4,460	7.93		140	-0.07	31.9	recovery	
4,470	7.94		150	-0.06	29.8	recovery	
4,480	7.94		160	-0.06	28.0	recovery	
4,490	7.93		170	-0.07	26.4	recovery	
4,500	7.93		180	-0.07	25.0	recovery	

Aquifer Tes	t Data from (	Observation	Well DW-2					
Inland Bays Regional Wastewater Facilities in Sussex County, DE								
start date:	June 19, 201	7	Dat	a from: Soi	merset Well D	rilling		
static water	level = 8.00	feet below la	and surface			-		
t = time sind	ce pumping s	started (min	utes)					
d = depth to	water belov	/ land surfac	ce (feet)					
t' = time sin	ce pumping	stopped (mi	nutes)					
s = drawdov	wn (feet) = d	- static s	' = residual	drawdown	(feet) = d - sta	itic		
<u>t</u>	<u>d</u>	<u>s</u>	<u>t'</u>	<u>s'</u>	<u>t / t'</u>	phase		
4,560	7.86	_	240	-0.14	19.0	recovery		
4,620	7.58		300	-0.42	15.4	recovery		
4,680	7.57		360	-0.43	13.0	recovery		
4,740	7.49		420	-0.51	11.3	recovery		
4,800	7.44		480	-0.56	10.0	recovery		
4,860	7.35		540	-0.65	9.0	recovery		
4,920	7.26		600 -0.74 8.2 recovery					
4,980	7.17		660	-0.83	7.5	recovery		
5,040	7.09		720	-0.91	7.0	recovery		

Location: In	land Bays R	egional Waste	water Facil	ities in Susse	ex County, D	elaware	
Drilled by:	Somerset W	ell Drilling Co	., Inc.				
Descriptions	by: S. Mog	ilnicki / WRA	dat	e: April 6, 2	017		
Major comp	onent in CA	PITALS; and					
= 35-50%; so	ome = 20-35	5%; little =					
10-20%; tra	ce = 1-10%						
From (feet)	To (feet)	Description					
0	10	SAND, brown	n (trace whi	te and black	), fine to me	dium, quartz	
10	20	SAND, brown	n (trace yell	ow, white), r	nedium to co	oarse, quartz	<u>'</u>
20	30	SAND, white	and brown	, medium, qı	uartz		
30	40	SAND, orange	e-brown, m	edium to co	arse, quartz;		
		trace gravel,	yellow and	red, subang	ular, quartz		
40	50	SAND, brown	SAND, brown, medium to coarse, quartz				
		trace gravel,	trace gravel, yellow, brown, red, subangular, quartz				
50	60	SAND, brown	SAND, brown to orange-brown, fine to medium, quartz				
		trace gravel,	yellow, bro	wn, gray, su	bangular, qu	artz	
60	70	SAND, brown	n to orange-	brown, fine	to medium,	quartz	
		trace gravel,				artz	
70	80	SAND, brown		-	Z		
		trace lumps of					
		trace gravel,	-		_	subrounded,	quartz
80	90	SAND, brown	n, fine to me	edium, quart	Z		
		trace lumps of					
		trace gravel,					
		[includes clay				ick, at about	: 82 ft.]
90	100	SAND, brown	-	•			
		trace gravel,	clear, red, y	yellow, gray,	subangular	to subround	ed, quartz



### JOHN D. HYNES & ASSOCIATES, INC.

Geotechnical and Environmental Consultants
Monitoring Well Installation
Construction Inspection and Materials Testing

July 13, 2017

Mr. J. Blake Burroughs Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, Maryland 21231

Re: Aquifer Testing Report Transmittal Inland Bays Regional Wastewater Facilities
Sussex County, Delaware
Project No.: JDH-10/16/279

Dear Mr. Burroughs:

John D. Hynes & Associates is pleased to present the report summarizing data that was collected during completion of the 72 hour aquifer test and 12 hour recovery test for the referenced project. Collection of the aquifer test data was completed by Somerset Well Drilling Co., Inc. (Somerset). The work was performed in general accordance with the Specifications for Borings and Wells document, dated May 11, 2016, that was prepared by WRA. In addition to the attached document, a digital copy of the raw aquifer test data will be forwarded to you via email.

The attached report that was prepared by Somerset includes well driller boring logs and well logs for observation well DW-1 and test well DW-2, an E-log of well DW-1, results of the sieve analysis used for test well design, and a summary of the data that was collected during the 72 hour aquifer test and 12 hour recovery test. Well DW-2 (6 inch diameter) was used as the pumping well and well DW-1 (2 inch diameter) was used as the observation well. Both wells were completed to depths of 80 feet. The wells are separated by a distance of 30 feet. Aquifer pumping, completed for a duration of 72 hours and at a rate of 101.8 gpm, was initiated on June 19, 2017. The 12 hour recovery test was initiated on June 22, 2017.

Hynes & Associates appreciates the opportunity to be of service to you. If you have any questions regarding this report or if we may be of further assistance, please contact our office.

President

Respectfully,

JOHN D. HYNES & ASSOCIATES, INC.

Richard D. Rhoads Project Manager

RDR: JDH/jsl

c.c.: Steve Mogilnicki; Whitman, Requardt & Associates, LLP; Via Email: smogilnicki@wrallp.com

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# Inland Bays Regional Waste Water Sussex County Delaware

**Borings and Wells** 

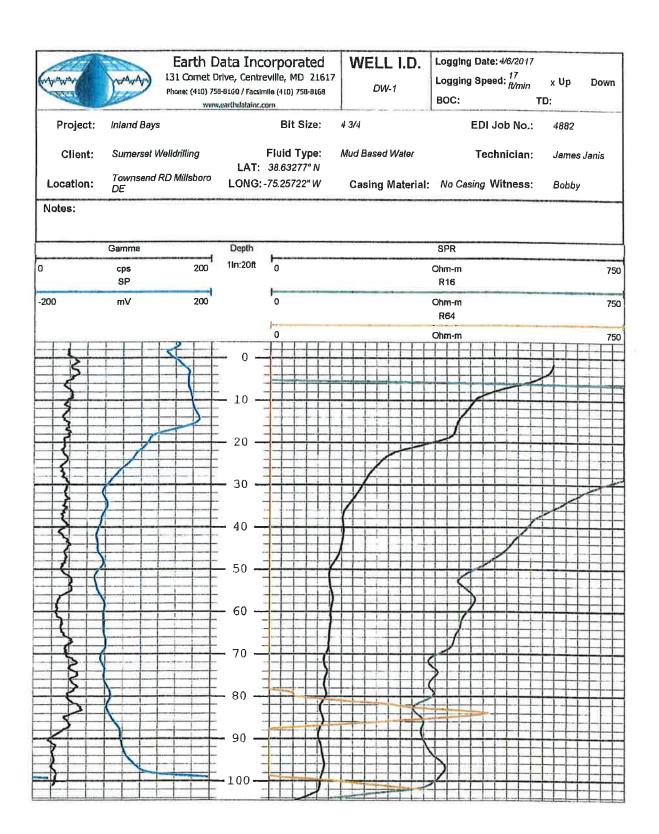
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## Inland Bays Regional Waste Water Sussex County Delaware

E-Log



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## Inland Bays Regional Waste Water Sussex County Delaware

**Drillers Log Test Bores** 

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Pump

**Island Bay Project** 

DW-1

4/6/2017

**Inland Bays** 

**Before** 

Serial #

**After** 

Drop

Tank

**GPM** 

Grout

Date

Permit No.

Iron

Hardness

Name:

Clorides

**Well Location** 

PP

Formation Description	From	То	Water
Surface soil some Brown Clay	0	5	
Tan Sand Medium	5	10	
Tan Sand Course , Some Light Gravel & Small Traces of Yellow &	10	20	
White Clay			
Tan Sand Course with Some Light Gravel	20	25	
Gold Sand Course Some light Gravel, Yellow & white trace Clay	25	30	, , , ,
Course Gold & Tan Sand and Some Heavy Gravel	30	40	
Course Gold Sand and Some Medium Gravel	40	50	
Course Gold & Tan Sand & Some Medium Gravel, Some small traces	50	60	
of Tan Clay			
Course Gold Sand with Medium Gravel	60	70	
Medium to Course gold & Tan Sand with Small Gravel & Traces of	70	80	NI-CO-
Tan Clay			
Gray and Tan Clay	80	82	
Medium Gold & Tan Sand and some Light Gravel	82	90	
Course Tan and Gold Sand with Some reddish brown gravel & Sand	90	100	
Reddish Brown Sand & Course Gravel	100	109	
		100000000	
100 (1 William)   100 p. 200 p			
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		//119)	

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Pump

**Inland Bay Project** 

DW-2

Serial # Drop

Tank

Date

Permit No.

6/6/2017

Name:

256937 (6" Well) **Sussex County-Inland Bays**  **Before** 7.53'

After

17.1883'

**GPM** 

101 47'

Grout

Iron

**Hardness** Clorides

Well Location Mount Joy Road	PP		
Millisboro, De 19966			
Formation Description	From	То	Water
Surface Soil	0	5	
Tan Sand with some Clay	5	10	
Clay	10	20	
Tan Sand Gravel	20	30	
Course Gold Sand / Tan Gravel	30	40	
Coarse Gold Sand with some medium Gravel	40	50	
Course Gold and Tan Sand and Gravel	40	50	i
Course Gold Sand and Gravel some traces of Tan Clay	50	60	
Course Gold Sand with some Medium Gravel	60	70	
Medium to Course Sand and Gravel	70	81	
Gray / Tan Clay	81	. 82	
Set Well 6" X 80' PVC Flush joint PVC with 30' of #.040 Slot PVC.			
Flush Joint Screen , Well Gravel packed with #2 Well Gravel.			
Gravel Level terminated at 47'.			
Well Grouted with Bentonite Clay from 47' to surface.			
1			

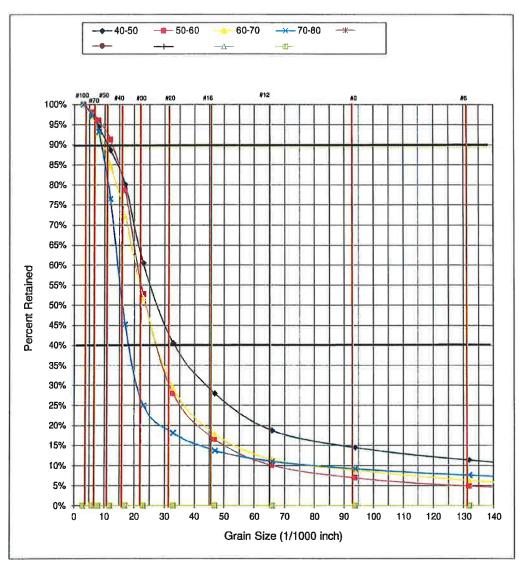
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## Inland Bays Regional Waste Water Sussex County Delaware

Sand Sieve Analysis



Job Name Inland Bay Regional Wastewater F Location Sussex Court, DE Driller Somerset Well Drilling Co. Inc. Sample ID 041717-1 Analyzed by: Al Smith, 651-638-3160 Date: 4/17/2017

Casing \$\phi\$ 6" Screen \$\phi\$ 6" Yield 100 GPM SWL (ft) 15'

Recommended Slot Size 40 Slot From 40' - 80' Recommended Gravel Pack #2 Morie

Based exclusively on the samples provided by the contractor, a sieve analysis graph and suggested screen slot size is provided as requested. Since numerous construction considerations and site circumstances influence successful well completion, Johnson Screens assumes no responsibility for final well performance nor awareness of local regulations pertaining to well installations.

Prepared by:Smlth, Albert J

Send Samples to 1950 Old Highway 8, New Brighton, MN 55112

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## Inland Bays Regional Waste Water Sussex County Delaware

**Well Logs** 



30176 RITKEL HOAD! RQ, BOX 47 WESTOVER, MARYLAND 21871-0047 (410) 681-2721 FAX (410) 681-8286

**Pump** 

**Inland Bay Project** 

**Before** 

7.53'

Serial #

DW-2

After

17.18831

Drop

101

Tank

**GPM** Grout

47'

Date

6/6/2017

Iron

Permit No.

256937 (6" Well)

Hardness

Name:

**Sussex County-Inland Bays** 

Clorides

**Well Location** 

**Mount Joy Road** 

PP

Millisboro, De 19966

Formation Description	From	T	14/-4-
Surface Soil		To	Water
Tan Sand with some Clay	5	5	
Clay	10	10 20	<b>—</b>
Tan Sand Gravel	20		
Course Gold Sand / Tan Gravel	30	30	
Coarse Gold Sand with some medium Gravel	40	40	
Course Gold and Tan Sand and Gravel	40	50	
Course Gold Sand and Gravel some traces of Tan Clay	50	50	
Course Gold Sand with some Medium Gravel	60	60 70	
Medium to Course Sand and Gravel	70	70 81	
Gray / Tan Clay	81	82	
Set Well 6" X 80' PVC Flush joint PVC with 30' of #.040 Slot PVC.			
Flush Joint Screen , Well Gravel packed with #2 Well Gravel.			
Gravel Level terminated at 47'.			
Well Grouted with Bentonite Clay from 47' to surface.			
N 25			
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30170 RITEEL ROAD+ RO, BOX 67 WESTOVER, MANYLAND 21871-0967 (410) 681-3721 FAX (410) 681-8288

Pump	Island Bay Project	Before	8'
Serial#	DW-1	After	18'
Drop		GPM	90
Tank		Grout	47'
Date	6/5/2017	Iron	
Permit No.	256938 (2" Well)	Hardness	
Name:	Sussex County-Inland Bays	Clorides	

Well Location Mount Joy Road PP

Millisboro, De

Millisboro, De			
Formation Description	From	То	Water
Surface soil some Brown Clay	0	5	
Tan Sand Medium	5	10	
Tan Sand Course , Some Light Gravel & Small Traces of Yellow &	10	20	
White Clay			
Tan Sand Course with Some Light Gravel	20	25	
Gold Sand Course Some light Gravel, Yellow & white trace Clay	25	30	
Course Gold & Tan Sand and Some Heavy Gravel	30	40	
Course Gold Sand and Some Medium Gravel	40	50	
Course Gold & Tan Sand & Some Medium Gravel, Some small traces	50	60	
of Tan Clay			
Course Gold Sand with Medium Gravel	60	70	
Medium to Course gold & Tan Sand with Small Gravel & Traces of	70	80	
Tan Clay			
Gray and Tan Clay	80	82	
Set Well 2"X 80' PVC flush Jpint PVC with 30' of #.040 Slot PVC Flush			-
Joint Scren. Well Gravel Packed with #2 Well gravel.			
Gravel Level terminated at 47'			
Well Grouted with bontonite clay from 47' to surface.			
	1.		
			-
	-		
30 - 30 0			

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## Inland Bays Regional Waste Water Sussex County Delaware

**Aquifer Test Results** 

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30170 RITZEL ROAD: P.O. BOX 67 WESTOVER, MARYLAND 21871-0067 (410) 651-3721 FAX (410) 651-5258

Serial\_number:

1052097

Solinst Level Looger/Model 3001 Constant rate/ Recovery test Inland Bay 6" well test Millisboro De **Inland Bays Aquifer Testing** 

Millisboro, De

72 Hour test start @ 6/19/2017 10:30 am Constant Flow

4" Orlfice tube with 2 1/2" orifice Set at 101.8 GPM

Serial\_number:

2032362

Solinst Level Looger/Model 3001 Constant rate/ Recovery test Inland Bay 2"Observation well test Mllfisboro De

Solinst Level Loggers where used with Barologger ( at ground level ) for instrument readings

42	 Scone	to Co	house	امیرما

	43		Ground Level					
	6"	Manual	readings					
	M Scope							
	FT a	bove groun	d					
	3.7	11.23 11.2						
	3.7	26.4371	22,2					
	3.7		22.2					
	3.7	22.4661						
	3.7		22.2					
	3.7	23.1618	22.3					
	3.7		22.3					
	3.7	21.827	22.3					
	3.7		22.4					
	3.7		22.4					
	3.7							
	3.7	21,8344	22.4					
	3.7	22.3672	22.4					
	3.7	22.0402	22.4					
	3.7	22.7864	22.4					
	3.7	22.3881	22.4					
	_							
	3.7	21.6211	22.4					
	3.7		22.4					
	3.7	22.1211	22.4					
	3.7	21.7433	22.4					
	3.7	22.2678	22.35					
d	3.7	22.8112	22.47					
	3.7	22.4722	22.45					
	3.7	22.5957	22.4					
	3.7	23.2811	22.4					
	3.7	22.3558	22.4					
-11	3.7	22.7953	22.4					
	3.7	22.8297	22.3					
	3.7	22.3086	22.45					
	3.7	23.6178	22.45					
	3.7	21.6162	22.45					
	3.7	21.0935	22.45					
	3.7	22.4145	22.45					
	3.7	23.2154	22.45					
	3.7	23.2896	22.45					
	3.7	22.7061	22.45					
	3.7	21.4711	22.45					
	3.7	23.2554	22.45					
	3.7	22.573	22.45					
	3.7	21.4478	22.52					
	3.7	22.8498	22.5					
	3,7	21.6172	22.5					
	3.7	21.5144	22.65					
	3.7	22.6711	22.65					
	3.7	20.8479	22.69					
	3.7	21.2243	22.69					
- [	3.7	23.3385	22.65					
	3.7	21.395	22.6					
	3.7	23.7354	22.6					

2" OB V	Vell
Static	TEMPERATURE
8	13.484
9.05	13.483
9.0468	
9.0902	13.476
9.1122	13.471
9.1414	13.466
9.1765	13.462
9.1945	13.458
9.1991	13.455
9.21	13.451
9.2259	13.448
9.2283	13.442
9.2431	13.436
9.2411	13.433
9.2422	13.43
9.2545	
9.2462	13.425
9.2501	13.422
9.2446	13.421
9.2421	13.419
9.2391	
9.2561	13.415
9.2727	13.413
9.2675 9.2639	13.411
9.2587	13.41 13.41
9.2594	13.409
9.2571	13.407
9.2606	13.407
9.2713	13.406
9.2826	13.405
9.2721	13.405
9.2775	13.404
9.2832	13,404
9.2833	13.403
9.2903	13.403
9.2876	13.403
9.2914	13.401
9.2833	13.401
9.2906	13.4
9.324	13,399
9.3207	13.398
9.3461	13.397
9.3618	13.397
9.351	13.397
9.332	13.396
9.3061	13.397
9.3048	13.396
9.2548	13.395

				6"	Well
Date		Time	ms	Static	TEMPERATURE
	6/19/2017	10:30:00 AM	О	7.53	13.017
	6/19/2017	10:31:00 AM	0	22.7371	12.97
	6/19/2017	10:32:00 AM	0	18.724	12,927
	6/19/2017	10:33:00 AM	0	18.7661	12.924
	6/19/2017	10:34:00 AM	0	18.5506	12,933
_	6/19/2017	10:35:00 AM	0	19.4618	12.946
	6/19/2017	10:36:00 AM	0	18.8998	12.962
	6/19/2017	10:37:00 AM	0	18.127	12.98
	6/19/2017	10:38:00 AM	0	17.6378	12.998
	6/19/2017	10:39:00 AM	0	18.3513	13.015
_	6/19/2017	10:40:00 AM	0	18.6578	13.028
_	6/19/2017	10:42:00 AM	0	18.1344	13.051
_	6/19/2017	10:44:00 AM	0	18.6672	13.068
_	6/19/2017	10:46:00 AM	0	18.3402	13.081
	6/19/2017	10:48:00 AM	0	19.0864	13.091
_		10:50:00 AM	0	18.6881	13.098
	6/19/2017	10:52:00 AM	0	17.9211	13.102
	6/19/2017		_		
	6/19/2017	10:54:00 AM	0	19.2047	13.105
	6/19/2017	10:56:00 AM	0	18.4211	13.106
	6/19/2017	10:58:00 AM	0	18.0433	13.108
	6/19/2017	11:00:00 AM	0	18.5678	13.109
	6/19/2017	11:05:00 AM	0	19.1112	13.112
	6/19/2017	11:10:00 AM	0	18.7722	13.113
	6/19/2017	11:15:00 AM	0	18.8957	13.111
	6/19/2017	11:20:00 AM	0	19.5811	13.111
	6/19/2017	11:25:00 AM	0	18.6558	13.112
	6/19/2017	11:30:00 AM	0	19.0953	13.113
	6/19/2017	11:40:00 AM	0	19.1297	13.114
	6/19/2017	11:50:00 AM	0	18.6086	13.115
	6/19/2017	12:00:00 PM	0	19.9178	13.112
	6/19/2017	12:10:00 PM	0	17.9162	13,112
	6/19/2017	12:20:00 PM	0	17.3935	13.112
	6/19/2017	12:30:00 PM	0	18.7145	13,113
	6/19/2017	12:40:00 PM	0	19.5154	13.114
	6/19/2017	12:50:00 PM	0	19.5896	13.115
	6/19/2017	1:00:00 PM	0	19.0061	13.116
	6/19/2017	1:10:00 PM	0	17.7711	13.116
	6/19/2017	1:20:00 PM	0	19.5554	13.117
	6/19/2017	1:30:00 PM	0	18.873	13.119
	6/19/2017	2:30:00 PM	0	17.7478	13.141
	6/19/2017	3:30:00 PM	O	19.1498	13.144
	6/19/2017	4:30:00 PM	0	17.9172	13.149
	6/19/2017	5:30:00 PM	0	17.8144	13.153
	6/19/2017	6:30:00 PM	0	18.9711	13.152
	6/19/2017	7:30:00 PM	O	17.1479	13.149
	6/19/2017	8:30:00 PM	0	17.5243	13.151
	6/19/2017	9:30:00 PM	ol	19.6385	13.149
	6/19/2017	10:30:00 PM	ol	17.695	13.149
	6/19/2017	11:30:00 PM	ol	20.0354	13.148

		Inland	Bays Aq	uifer Testing	43 " I	M Scope to	Ground Level		
SOM	ERSET			Well	6 "	Manual	readings	2" OB V	Vell
					M Sc	оре			
Date	Time	ms	Static	TEMPERATURE		ove ground		Static	TEMPERATURE
6/20/20:		0		13.147	3,7	23.1955	22.6	9.1777	13.395
6/20/203		0		13.148 13.148	3.7	23.1463	22.6	9.1234 9.0566	13.393 13.392
6/20/20:		0		13.149	3.7	21.1197	22.6	9.0001	13.392
6/20/20:		0		13.15	3.7	21.3565	22.55	8.9617	13.391
6/20/20:	.7 5:30:00 AM	0		13.148	3.7	22.6879	22.5	8.9064	13.39
6/20/20:		0		13.148	3.7	22.1306	22.5	8.871	13.389
6/20/20:		0		13.146 13.143	3.7	20.6126	22.51	8.8343 8.8729	13.387
6/20/20:		0		13.143	3.7	21.9764	22.53	8.8729 8.9143	13.388 13.387
6/20/20:		0		13.141	3.7	21.909	22.5	9.0112	13.388
6/20/20:		0	18.1081	13.134	3.7	21.8081	22.43	9.06	13.387
6/20/20:		0		13.127	3.7	22.9603	22.41	9.0449	13.387
6/20/20:		0		13.128	3.7	23.6037	22.39	9.0182	13.386
6/20/202		0		13.128	3.7	21.4599	22.4	9.0425	13.385
6/20/20:		0		13.129 13.129	3.7	21.9581 22.4692	22.38 22.39	9.0377 8.9974	13.385 13.383
6/20/20		0		13.132	3.7	21.3316	22.41	8.9514	13.384
6/20/201		0		13.132	3.7	21.3066	22.44	8.8791	13.383
6/20/201	.7 7:30:00 PM	0	18.1196	13.13	3.7	21.8196	22.44	8.7999	13.382
6/20/201		0		13.132	3.7	21.2928	22.44	9.2162	13.382
6/20/201		0		13.134	3.7	21.5596	22.41	9.2149	13.383
6/20/201		0		13.134 13.12	3.7	23.1585	22.39	9.201 9.1996	13.382
6/20/201		0		13.12	3.7	21.8136 23.8801	22.39	9.1928	13.381 13.381
6/21/201		0		13.118	3.7	21.1717	22.39	9.1911	13.381
6/21/201		0	19.9355	13.123	3.7	23.6355	22.38	9.1992	13.38
6/21/201		0	19.1475	13.123	3.7	22.8475	22.39	9.1853	13.38
6/21/201		0	17.7145	13.124	3.7	21.4145	22.39	9.1802	13,38
6/21/201		0	18.5851	13.122	3.7	22.2851	22.5	9.1936	13.38
6/21/201		0	19.6998 18.576	13.122 13.123	3.7	23.3998	22.5 22.5	9.1889 9.1891	13.379 13.379
6/21/201		0	20.0665	13.122	3.7	23.7665	22.5	9.188	13.376
6/21/201		o	18.2813	13.118	3.7	21.9813	22.55	9.1803	13.376
6/21/201	7 10:30:00 AM	0	17.9821	13.119	3.7	21.6821	22.5	9.1953	13.376
6/21/201	<del></del>	0	18.1123	13.119	3.7	21.8123	22.43	9.1957	13.376
6/21/201		0	19.088	13.117	3.7	22.788	22.41	9.1999	13.377
6/21/201		0	18.2149 19.7176	13.119 13.117	3.7	21.9149 23.4176	22.39	9.2028 9.2081	13.377 13.377
6/21/201		0	17.9245	13.115	3.7	21.6245	22.38	9,2107	13.377
6/21/201		0	18.0248	13.117	3.7	21.7248	22.38	9.2267	13.375
6/21/201		0	19.4308	13.117	3.7	23.1308	22.39	9.2226	13.375
6/21/201		0	18.2003	13.118	3.7	21.9003	22.41	9.2233	13.375
6/21/201		0	20.0392	13.121	3.7	23.7392	22.44	9.2243	13.375
6/21/201 6/21/201		0	17.5701 18.4222	13.115 13.118	3.7	21.2701 22.1222	22.44	9.2176 9.3155	13.374 13.374
6/21/201		0	17.8962	13.119	3.7	21.5962	22.41	9.2773	13.373
6/21/201	7 11:30:00 PM	0	18.1508	13.117	3.7	21.8508	22.39	9.2578	13.373
6/22/201		0	19.9673	13.117	3.7	23.6673	22.39	9.2195	13.371
6/22/201		0	19.459	13.115	3.7	23.159	22.39	9.1786	13.372
6/22/201		0	18.0771 17.5155	13.115 13.117	3.7	21.7771 21.2155	22.39 22.38	9.1524	13.371
6/22/201		0	17.5155	13.117	3.7	21.2155	22.38	9.0409	13.37 13.37
6/22/201		o	19.1211	13.116	3.7	22.8211	22.44	8.9831	13.37
6/22/201		0	18.4679	13.113	3.7	22.1679	22.43	8.9489	13.368
6/22/201		0	17.3282	13.117	3.7	21.0282	22.43	8.9323	13.367
6/22/201		0	17.334	13.114	3.7	21.034	22.4	9.0351	13,367
6/22/201 6/22/201		0	17.9287 17.1883	13.116 13.117	3.7	21.6287	22.4	9.2003 9.3026	13.367 13.365
Pump Off	7 10:30:00 AIVI	U	17.1003	13.117	3.7]	20.0003	22.4	9.3020	13.303
Start Recovery Te	it				let-				
6/22/201		0	8.2474	13.077	3.7	11.9474	11.68	8.5747	13.365
6/22/201		0	8.0068	13.034	3.7	11.7068	11.44	8.3981	13.364
6/22/201		0	7.8975	13.02	3.7	11.5975	11.36	8.3126	13.362
6/22/201 6/22/201		0	7.834 7.7953	13.013 13.012	3.7	11.534	11.3 11.26	8.2636 8.2339	13.361 13.36
6/22/201		0	7.771	13.012	3.7	11.4953	11.26	8.2339	13.36
6/22/201		0	7.7504	13.015	3.7	11.4504	11.21	8.1914	13.359
6/22/201		0	7.7352	13.017	3.7	11.4352	11.2	8.1871	13.359

Inland Bays Aquifer Testing

			6" Well		
Date		Time	ms	Static	TEMPERATURE
	6/22/2017	10;39:00 AM	0	7.7206	13.022
	6/22/2017	10:40:00 AM	0	7.7145	13.03
nucroso	6/22/2017	10:42:00 AM	0	7.6993	13.049
	6/22/2017	10:44:00 AM	0	7.6946	13.075
	6/22/2017	10:46:00 AM	0	7.6925	13.103
	6/22/2017	10:48:00 AM	0	7.6887	13.129
	6/22/2017	10:50:00 AM	0	7.6887	13.14
	6/22/2017	10:52:00 AM	0	7.7003	13.147
	6/22/2017	10:54:00 AM	0	7.7091	13.161
	6/22/2017	10:56:00 AM	0	7.7106	13.207
	6/22/2017	10:58:00 AM	0	7.7078	13.255
	6/22/2017	11:00:00 AM	0	7.7278	13.285
	6/22/2017	11:05:00 AM	0	7.7364	13.313
	6/22/2017	11:10:00 AM	0	7.7128	13,338
	6/22/2017	11:15:00 AM	0	7.7007	13.34
	6/22/2017	11:20:00 AM	. 0	7.6916	13.334
	6/22/2017	11:25:00 AM	C)	7,5773	13.332
	6/22/2017	11:30:00 AM	0	7.4585	13.334
	6/22/2017	11:40:00 AM	0	7.4679	13.357
	6/22/2017	11:50:00 AM	0	7.48	13.365
	6/22/2017	12:00:00 PM	0	7.4771	13.357
	6/22/2017	12:10:00 PM	Q	7.4761	13.354
-	6/22/2017	12:20:00 PM	0	7.4747	13.344
	6/22/2017	12:30:00 PM	CI	7,4844	13,331
	6/22/2017	12:40:00 PM	0	7.4733	13,328
	6/22/2017	12:50:00 PM	C)	7.4678	13.342
	6/22/2017	1:00:00 PM	0	7,4776	
	6/22/2017	1:10:00 PM	0	7,4828	13,304
	6/22/2017	1:20:00 PM	0	7.4678	13.291
	6/22/2017	1:30:00 PM	0	7.4692	13.289
	6/22/2017	2:30:00 PM	0	7.4001	13.243
	6/22/2017	3:30:00 PM	0	7.1237	13.203
	6/22/2017	4:30:00 PM	0	7.109	13.167
-0	6/22/2017	5:30:00 PM	0	7.0293	13.14
	6/22/2017	6:30:00 PM	0	6.9714	13.12
	6/22/2017	7:30:00 PM	0	6.8938	13.105
	6/22/2017	8:30:00 PM	0	6.8031	13.091
	6/22/2017	9:30:00 PM	0	6.7117	13.08
	6/22/2017	10:30:00 PM	0	6.6303	13.073

43 M Scope to Ground Level

6"		adings
M Sc		
	ove ground	44.44
3.7		11.19
3.7		11,18
3.7	11.3993	11.1
3.7		11.1
3.7		11.13
3.7	11.3887	11.1
3.7	11.3887	11.13
3.7	11.4003	11.13
3.7	11.4091	11.1
3.7	11.4106	11.1
3.7	11,4078	11.1
3.7	11.4278 11.4364	11,1
3.7		11.:
3.7		11,1
3.7	11.4007 11.3916	11.09
3.7		11.09
3.7	11.2773	11.0
3.7	11.1585	11.0
3.7	11.16/9	
3.7		11.0
3.7	11.1771 11.1761	11.0
3.7	11.1747	11.0
3.7	11.1747	11.0
3.7	11.1733	11.0
3.7	11.1678	11.0
3.7	11.1776	11.00
3.7	11.1778	11.00
3.7	11.1678	11.00
3.7	11.1692	11.00
3.7	11.1001	11.0
3.7	10.8237	11.04
3.7	10.809	11.0
3.7	10.7293	11.0
3.7	10.6714	11,01
3.7	10.5938	11.01
3.7	10.5031	11.0
3.7		11.01
37	10.3303	11.01
3.7	20,00001	11.02

Static	TEMPERATURE
8.1619	13.36
8.1624	13.359
8.1498	13.37
8.15	13.372
8.1398	13.372
8.1393	13.373
8.1394	13.374
8.1476	13.374
8.1643	13.374
8.161	13.374
8.1617	13.374
8.1858	
8.1919	13.363
8.1732	13.363
8,158	
8.1525	13.363
8.0373	13.364
7.9163	13.364
7.9375	
7.9334	13.366
7.8602	13.365
7.582	13.365
7.5702	
7.491	13.367
7,4359	
7.3533	
7.2646	13,368
7,1661	13.368
7.0885	13.368
8.1525	
8.1531	13.367
8.1598	13.367
8,1504	13.368
8.1584	13.368
8.1564	13.367
8,1566	13.368
8.158	13.368
8,1505	13.368
8,1549	13.368

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944 FAX: 302-739-7764

## STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

#### **WELL COMPLETION REPORT**

- OFFICIAL USE ONLY -

PAGE # 1 OF 4 PAGES
PERMIT #: 256937

		PERMIT #: <u>A3 4 73 7</u>
Owner:	Sussex County	LOCATION MAP - ROAD MAP
Address:	PO Box 589	County: Sussex
	Georgetown DE US 19947	Tax Parcel: 2-34-21.00-0151.03
Telephone:	(410)546-6462	Lot #:
Email:		WELL HEAD COMPLETION
Permit #:	256937	Type: Other
Local ID:		Other: Well Head Protector
Licensed Prep	parer / WC: Somerset Well Drilling Co Inc	Well Head Completed: 30.00 in.
	4033	Above Ground Surface
Well Driller in		Was the Well Tag attached in accordance with current regulations?
	4034	Yes
Construction I	······································	Comments:
Total Depth of		]
Construction I		]
Casing	Top Bottom Diameter Material	,
Inner Casino	The second of the second secon	
Screen Materia		]
Тор:	47.00 <b>Bottom</b> : 80.00	·
Type of Grout		
Тор:	0.00 <b>Bottom</b> : 47.00	
Gravel Pack In		
Тор:	47.00 <b>Bottom</b> : 80.00	
	Frout Backfill of Well Annulus: None	
Top:	0.00 Bottom: 0.00	
Screen Slot Si		
Gravel Pack S		1
Static Water L		]
Date:	6/22/2017	
	er Level: 17.0000 ft.	X: 214190.70
Date:	6/22/2017	Y: 70135.64
After:	72.00 hrs.	2015/23
Pumping at:	101.00 GPM	
	vsical Log Taken? Yes	
Parcel Size:	Greater than 0.5 Acre	
Proposed Well	2	
3450.00	Feet of the FRONT property line	
3550.00 1020.00	Feet of the LEET property line	
2800.00	Feet of the LEFT property line Feet of the RIGHT property line	
1020.00	Feet from the NEAREST road	
1.00	Feet from the NEAREST road  Feet from the SEPTIC TANK and all components	
2.00	Feet from the SEPTIC TANK and all components  Feet from the SEPTIC DRAINFIELD/CESSPOOL	
0.00	Feet from the SENTRAL SEWER LINE	Name of the second seco
	IRM THE INFORMATION I HAVE SUBMITTED IS	
	ND CORRECT.	
Signature - Lic	ensed Preparer/Well Contractor Date	
Signature - Pro	pperty Owner Date	** 10 miles
<b>J</b>		
	<u> </u>	

Hardness:

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

### STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

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#### **WELL COMPLETION REPORT**

- OFFICIAL USE ONLY -

PAGE# 2 OF 4 PAGES

FAX: 302-739-7764 256937 PERMIT #: **FORMATION LOG** Other Formation Type: Other: Surface Soil Formation Type With: Other Other: N/A From: 0.00 To: 5.00 Color: N/A Texture Other: To: Other: Cement: Other Sorting: Other: Hardness: Other: Comment: Formation Type: Coarse Sand Other: Formation Type With: Clay Other: From: 5.00 To: 10.00 Color: Tan Other: Texture Coarse Other: To: Coarse Cement: Other Sorting: Other: Hardness: Other: Comment: Formation Type: Clay Other: Formation Type With: Clay Other: From: 10.00 To: 20.00 N/A Color: Other: Texture To: Other: Cement: Other Sorting: Other: Hardness: Other: Comment: Formation Type: Gravel Other: Formation Type With: Sand Other: From: 20.00 To: 30.00 Color: Tan Texture Other: To: Other: Cement: Other Sorting: Other: Hardness: Other: Comment: Formation Type: Gravel Other: Formation Type With: Sand Other: Coarse 30.00 From: To: 40.00 Color: Tan & Gold Texture Other: To: Other: Cement: Other Sorting: Other:

Other:

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944 FAX: 302-739-7764

## STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

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#### **WELL COMPLETION REPORT**

- OFFICIAL USE ONLY -

PAGE # <u>3</u> OF <u>4</u> PAGES PERMIT #: <u>256937</u>

			PERMIT #:
Comment:			
Formation Type:	Gravel	Other:	Medium
ormation Type With:	Sand	Other:	Coarse
rom:	40.00	To:	50.00
Color:	Gold		
exture	<del>-</del> -	Other:	
То:		Other:	
ement:	<del></del>	Other	
iorting:	, . <u>.</u>	Other:	
lardness:		Other:	
Comment:		· <del></del>	
ormation Type:	Gravel	Other:	Medium
ormation Type With:	Sand	Other:	Coarse
rom:	50.00	To:	60.00
Color:	Gold & Tan		
l'exture		Other:	
То:		Other:	
ement:		Other	
iorting:		Other:	
lardness:		Other:	
Comment:	Coarse Gold Sand & Gr	ravel some traces of Tan Clay.	
ormation Type:	Gravel	Other:	Medium
ormation Type With:	Sand	Other:	Coarse
rom:	60.00	To:	70.00
Color:	Gold		
exture	10	Other:	
То:		Other:	
Cement:	-	Other	
Sorting:		Other:	
lardness:		Other:	
Comment:			
ormation Type:	Gravel	Other:	Medium
ormation Type With:	Sand	Other:	Medium to Coarse
rom:	70.00	То:	81.00
Color:	N/A		
'exture		Other:	
То:		Other:	<u> </u>
ement:		Other	
orting:		Other:	
lardness:		Other:	
Comment:			
ormation Type:	Clay	Other:	
ormation Type With:	Clay	Other:	
rom:	81.00	То:	82.00
Color:	Gray Tan		
exture		Other:	
To:		Other:	
Sement:		Other	
orting:		Other:	
lardness:			

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944

FAX: 302-739-7764

## STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

**WELL COMPLETION REPORT** 

http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

- OFFICIAL USE ONLY -

PAGE # 4 OF 4 PAGES
PERMIT #: 25,937

Comment:	 	╗
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WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944 FAX: 302-739-7764

## STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

### **WELL COMPLETION REPORT**

- OFFICIAL USE ONLY -

PAGE # \_\_\_ OF <u>#\_\_</u> PAGES PERMIT #: 256 938

		PERMIT #: <u>456 738</u>
Owner:	Sussex County	LOCATION MAP - ROAD MAP
Address:	PO Box 589	County: Sussex
	Georgetown DE US 19947	Tax Parcel: 2-34-21.00-0151.03
Telephone:	(410)546-6462	Lot#:
Email:		WELL HEAD COMPLETION
Permit #:	256938	Type: Other
Local ID:		Other: Well Head Protector
Licensed Pre	parer / WC: Somerset Well Drilling Co Inc	Well Head Completed: 30.00 in.
License #:	4033	Above Ground Surface
Well Driller in	n Charge:	Was the Well Tag attached in accordance with current regulations?
License #:	4034	Yes
Construction	Method: Mud Rotary	Comments:
Total Depth o	f Excavation: 80.00 feet	
Construction	Date: 6/20/2017	1
Casing	Top Bottom Diameter Material	· ·
	ng 0.00 47,00 2,00 PVC	
Screen Mater		
Тор:	47.00 <b>Bottom:</b> 80.00	
Type of Grout	t: Bentonite	
Тор:	0.00 Bottom: 47.00	
Gravel Pack I	nterval:	
Тор:	47.00 <b>Bottom:</b> 80.00	
Type of Non-C	Grout Backfill of Well Annulus: None	1
Тор:	0.00 Bottom: 0.00	·
Screen Slot S		
Gravel Pack S		
Static Water L		
Date:	6/20/2017	
<b>Pumping Wat</b>	ter Level: 18.0000 ft.	X: 214273.25
Date:	6/20/2017	Y: 70173.74
After:	4.00 hrs.	10113.14
Pumping at:	90.00 GPM	
	ysical Log Taken? Yes	
Parcel Size:	Greater than 0.5 Acre	
Proposed We		
3500.00	Feet of the FRONT property line	
3450.00	Feet of the BACK property line	
1120.00	Feet of the LEFT property line	
2700.00	Feet of the RIGHT property line	
1120.00	Feet from the NEAREST road	
1.00	Feet from the SEPTIC TANK and all components	
2.00	Feet from the SEPTIC DRAINFIELD/CESSPOOL	
0.00	Feet from the CENTRAL SEWER LINE	
	FIRM THE INFORMATION I HAVE SUBMITTED IS	
ACCURATE A	AND CORRECT.	
Ciamatras !!	conced Property Mall Contractor	
	censed Preparer/Well Contractor Date	
Signature - Pr	roperty Owner Date	1
1		

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944 FAX: 302-739-7764

## STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

### **WELL COMPLETION REPORT**

- OFFICIAL USE ONLY -

PAGE #\_2\_ OF <u>\$\frac{4}{2}\$</u> PAGES
PERMIT #: \$\frac{25}{6938}\$

			PERMIT #:
		ORMATION LOG	
Formation Type:	Other	Other:	Surface Soil
Formation Type With:	Clay	Other:	
From:	0.00	То:	5.00
Color:	Brown		
Texture		Other:	<del>, , <u>, , , , , , , , , , , , , , , , , </u></del>
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	
Comment:		······································	
Formation Type:	Medium Sand	Other:	
Formation Type With:	Sand	Other:	
rom:	5.00	To:	10.00
Color:	Tan		10.00
l'exture	Medium	Other:	
To:	Medium	Other:	
Cement:	modum	Other Other	
Sorting:		Other:	
Hardness:		Other:	
Comment:		- Julei.	
Johnnent.			
ormation Type:	Gravel	Other:	Light
ormation Type With:	Sand	Other:	Coarse
rom:	10.00	То:	20.00
Color:	Tan Yellow White		
Texture		Other:	
То:		Other:	
Cement:		Other	
Sorting:		Other:	
lardness:		Other:	
Comment:	Tan Coarse Sand, Some Lig	ht Gravel & Small Traces of Yel	llow & White Clay.
ormation Type:	Gravel	Other:	Light
Formation Type With:	Sand	Other:	Coarse
rom:	20.00	To:	25.00
Color:	Tan	<del></del>	
l'exture		Other:	,, ,, ,, , , , , , , , , , , , , , , ,
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	
Comment:			
Formation Type:	Gravel	Other:	Light
Formation Type With:	Sand	Other:	Coarse
rom:	25.00	To:	30.00
Color:	Gold Yellow White		
l'exture		Other:	<del></del>
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	

WATER SUPPLY SECTION DIVISION OF WATER RESOURCES 89 KINGS HIGHWAY DOVER, DELAWARE 19901

PHONE: 302-739-9944 FAX: 302-739-7764

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http://www.dnrec.state.de.us/

APPLICATION MUST BE SUBMITTED AND PERMIT RECEIVED BEFORE DRILLING IS STARTED.

#### **WELL COMPLETION REPORT**

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PERMIT #: 256938

			PERMIT #: 236736
Comment:	Gold Coarse Sand, Some	Light Gravel, Yellow & White Clay	y Traces.
Formation Type:	Gravel	Other:	Heavy
Formation Type With:	Sand	Other:	Coarse
From:	30.00	То:	40.00
Color:	Gold Tan		
Texture		Other:	
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	
Comment:			
Formation Type:	Gravel	Other:	Medium
Formation Type With:	Sand	Other:	Coarse
From:	40.00	То:	50.00
Color:	Gold		
Texture		Other:	
To:		Other:	
Cement:		Other	
Sorting:	<del></del>	Other:	
Hardness:		Other:	
Comment:			
Formation Type:	Gravel	Other:	Medium
Formation Type With:	Sand	Other:	Coarse
From:	50.00	To:	60.00
Color:	Gold Tan & Tan		
Texture		Other:	
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	<del></del>
Comment:	Coarse Gold & Tan Sand & Some Medium Gravel, Some Small Traces of Tan Clay.		
Formation Type:	Gravel	Other:	Medium
Formation Type With:	Sand	Other:	Coarse
From:	60.00	To:	70.00
Color:	Gold		
Texture		Other:	<del> </del>
To:		Other:	
Cement:		Other	
Sorting:		Other:	
Hardness:		Other:	
Comment:	- · · · · · · · · · · · · · · · · · · ·		
Formation Type:	Gravel	Other:	Small
Formation Type With:	Sand	Other:	Medium to Coarse
From:	70.00	To:	80.00
Color:	Gold Tan & Tan		
Texture		Other:	
To:		Other:	
Cement:	· · · <del>- ·</del>	Other	
Sorting:		Other:	
Hardness:		Other:	

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Medium to Coarse Gold & Tan Sand with Small Gravel & Traces of Tan Clay. Comment: Clay Formation Type: Other: Formation Type With: Clay Other: From: 80.00 To: 82.00 Color: Gray & Tan Other: Texture To: Other: Cement: Other Sorting: Other: Hardness: Other: Comment: